ATP 3-21.50

INFANTRY SMALL-UNIT MOUNTAIN AND COLD WEATHER OPERATIONS

JULY 2025

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.
This publication supersedes ATP 3-21.50, dated 27 August 2020.

HEADQUARTERS, DEPARTMENT OF THE ARMY

This publication is available at the Army Publishing Directorate site (https://armypubs.army.mil) and the Central Army Registry Site (https://atiam.train.army.mil/catalog/dashboard).

Army Techniques Publication
No. 3-21.50

Headquarters
Department of the Army
Washington, DC, 29 July 2025

INFANTRY SMALL-UNIT MOUNTAIN AND COLD WEATHER OPERATIONS

Contents

Page

Preface ..... **vii**
Introduction ..... **ix**
CHAPTER 1 ..... **1**
ORGANIZATION **1**
Section I – Overview **1**
Section II – Infantry Small-Unit Organizations **1**
Close Combat 1
Operational Influences 3
Section III – Environmental Considerations **4**
Operational and Mission Variables 4
Physical Characteristics 5
Effects on Infantry Small-Unit Operations 11
CHAPTER 2 ..... **13**
COMMAND AND CONTROL **13**
Section I – Leadership **13**
The Importance of Competent Leadership 13
Challenges Within Mountainous Terrain 13
Extreme Weather and Temperature Conditions 14
Section II – Mission Command **14**
Section III – Relationship Between Command and Control **15**
Command 15
Control 16
The Exercise of Command and Control 17
Command Post Organization and Operations 18
Section IV – Organizing and Putting Command and Control Into Action **23**
Operations Process 23

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.
*This publication supersedes ATP 3-21.50, dated 27 August 2020.

Intelligence Preparation of the Operational Environment 24
Analysis of Terrain and Weather 25
Centralized Planning and Decentralized Execution 29
CHAPTER 3 31
OFFENSE 31
Section I – Doctrinal Basis for the Offense 31
Offensive Operations 31
Characteristics of the Offense 32
Section II – Conduct of the Offense 34
Environmental Considerations 34
Plan and Prepare 34
Execute 40
Assess 42
Section III – Small-Unit Offensive Operations 42
Movement to Contact 42
Hasty and Deliberate Attacks 45
Variations of Attacks 47
CHAPTER 4 53
DEFENSE 53
Section I – Doctrinal Basis for the Defense 53
Defensive Operations 53
Characteristics of the Defense 56
Section II – Conduct of the Defense 57
Environmental Considerations 57
Plan and Prepare 58
Execute 62
Assess 66
Section III – Small-Unit Defensive Operations 67
Area Defense 67
Battle Positions 69
Defense of a Linear Obstacle 73
Perimeter Defense 75
Reverse-Slope Defense 77
CHAPTER 5 81
TACTICAL ENABLING OPERATIONS AND ACTIVITIES 81
Section I – Small-Unit Movement, Employment, and Maneuver 81
Tactical Movement 81
Observation Post 102
Combat Outpost 105

Tunnels and Caves 108
Base 111
Section II – Dismounted Movement Considerations 112
March Mission 112
Planning for the March 113
Preparations for the March 115
March Execution 116
Section III – Soldier Load Considerations 121
Echeloning Loads 121
Load Determination 122
Decisions to Reduce or Offset Risk 125
CHAPTER 6 127
AUGMENTING COMBAT POWER 127
Section I – Information Collection 127
Planning and Employment Considerations 127
Information Collection Plan 128
Execution of Tactical Missions 128
Soldier Sensor Missions 130
Section II – Direct Fires 131
Fundamental Principles 131
Direct Fire Weapons and Systems 131
Section III – Fire Support 135
Indirect Fires 136
Aviation Fires 139
Section IV – Engineer Support 141
Mobility 141
Countermobility 142
Section V – Protection 142
Survivability 142
Local Security 143
Chemical, Biological, Radiological, or Nuclear Defense 143
Air and Missile Defense 143
Countering Unmanned Aircraft System Threats 144
Camouflage, Noise, Light Discipline, and Emissions Control 147
Additional Protection Tasks 148
Section VI – Sustainment 148
Effects on Soldiers 149
Effects on Individual and Unit Equipment 157
Resupply Considerations 160

Section VII – Special Purpose Teams, Skills, and Attachments 165
Special Purpose Teams 165
Specialist Skills and Training 166
Attachments 167
Glossary 171
References 177
Index 181

Figures

Figure 1-1. Mountainous regions of the world 6
Figure 1-2. Operational terrain levels 7
Figure 1-3. Cold regions of the world 9
Figure 2-1. Retransmission station 22
Figure 3-1. Company deliberate attack, example 46
Figure 3-2. Company raid (insertion/infiltration), example 49
Figure 3-3. Company multiple ambushes (infiltration/occupation), example 51
Figure 4-1. Area defense (security area activities) 63
Figure 4-2. Area defense (main battle area engagements) 65
Figure 4-3. Area defense (platoon battle positions in-depth) 68
Figure 4-4. Primary, alternate, supplementary, and subsequent battle positions 71
Figure 4-5. Strong point battle position 73
Figure 4-6. Defense of a linear obstacle 75
Figure 4-7. Perimeter defense 77
Figure 4-8. Reverse-slope defense 78
Figure 5-1. Mountain road (mounted movement) 84
Figure 5-2. Enemy ambush on a narrow mountain pass 85
Figure 5-3. Using a fixed rope system 92
Figure 5-4. High angle mountaineering kit 93
Figure 5-5. Assault climber team kit 94
Figure 5-6. Snow and ice mobility kit 95
Figure 5-7. Ahkio sled 96
Figure 5-8. Helicopter slope landings 97
Figure 5-9. Overwatching a patrol 100
Figure 5-10. Observation post 104
Figure 5-11. Combat outposts 106
Figure 5-12. Tunnel system 109
Figure 5-13. Load tailoring diagram, example 126
Figure 6-1. Angle shooting 133
Figure 6-2. Mountain field artillery firing position outpost 136
Figure 6-3. Mountain effects on indirect fires 137

Tables

Table 1-1. Capabilities and limitations during Infantry small-unit operations 4
Table 2.1 Weather condition effects 29
Table 5-1. Terrain class mobility 87
Table 5-2. Dismounted movement rates 88
Table 5-3. Helicopter landing zone requirements 98

Table 6-1. Counter-unmanned aircraft system detection report (SALUTE format), example 147
Table 6-2. Pack animal considerations 164

This page intentionally left blank.

Preface

ATP 3-21.50 provides the Infantry small-unit leader with doctrinal guidance on how company-sized units and below conduct combat operations in mountain and cold weather regions. Commanders and subordinate leaders combine the basic doctrine described in ATP 3-21.10 and ATP 3-21.8, with tactics, techniques, and procedures (TTP) specific to missions in mountain and cold weather areas of operations. This publication is designed to work in conjunction with and complement ATP 3-90.97 and the training circular on military mountaineering, TC 3-97.61. This publication supersedes ATP 3-21.50, dated 2020.

The principal audience for ATP 3-21.50 is the commanders, staff, officers, and noncommissioned officers within the Infantry battalion. The audience includes the United States Army Training and Doctrine Command institutions and components and the United States Army Special Operations Command. This publication serves as an authoritative reference for personnel developing doctrine, materiel and force structure, institutional and unit training, and standard operating procedures for the Infantry small-unit operations.

To comprehend the doctrine contained in this publication, readers must first understand the characteristics of the Army profession (trust, honorable service, military expertise, stewardship, and esprit de corps) as described in ADP 1. Readers must understand the principles of war, the nature of unified land operations, and the links between the operational and tactical levels of war described in ADP 3-0, FM 3-0, and FM 3-96. In addition, readers should understand the fundamentals of the operations process found in ADP 5-0 and the concepts associated with the offense and defense contained in ADP 3-90, and the tactics in FM 3-90. The reader must comprehend how stability operations tasks described in ADP 3-07 and FM 3-07 carry over and affect offensive and defensive operations and vice versa. Readers must understand how the operations process fundamentally relates to the Army's military decision-making process and troop leading procedures, the elements of command and control as described in ADP 6-0, FM 6-0, and ATP 6-0.5, and understand the leadership principles of ADP 6-22 and FM 6-22. To comprehend how the Infantry rifle company organizes and is doctrinally employed, the reader must understand ATP 3-21.10 and ATP 3-21.20.

Commanders, staffs, and subordinates ensure that their decisions and actions comply with applicable United States, international, and, in some cases, host-nation laws and regulations. Commanders at all levels ensure that their Service members operate in accordance with the law of armed conflict and the rules of engagement. (See FM 6-27 for legal compliance.)

The use of a trade or brand name does not constitute endorsement of any specific commercial product, commodity, service, or enterprise by the United States Army.

ATP 3-21.50 uses joint terms where applicable. Selected joint and Army terms and definitions appear in both the glossary and the text. ATP 3-21.50 is not the proponent publication (the authority) for any operational term or definition. For other definitions shown in the text, the term is italicized, and the number of the proponent publication follows the definition. The use of a trade or brand name does not constitute endorsement of any specific commercial product, commodity, service, or enterprise by the United States Army

ATP 3-21.50 applies to the Active Army, Army National Guard/Army National Guard of the United States, and United States Army Reserve unless otherwise stated.

The proponent is the United States Army Maneuver Center of Excellence. The preparing agency for ATP 3-21.50 is the Department of Tactics, Training, and Doctrine, United States Army Maneuver Center of Excellence. Send comments and recommendations on DA Form 2028, (*Recommended Changes to Publications and Blank Forms*) to Commander, United States Maneuver Center of Excellence and Fort Benning, ATZK-TDD (ATP 3-21.50), 1 Karker Street, Fort Benning, GA 31905-5410; by email to usarmy.benning.mcoe.mbx.doctrine@mail.mil; or submit an electronic DA Form 2028.

This page intentionally left blank.

Introduction

When conducting military operations in mountains or cold weather environments, leaders and Soldiers must plan to fight two enemies: the environment and the opposing force. ATP 3-21.50 provides perspective on how Infantry small-unit commanders and subordinate leaders plan, prepare, execute, and assess missions in an operational environment characterized by high altitudes, rapidly changing climatic conditions, and rugged terrain. This environment challenges all the elements of combat power.

ATP 3-21.50 addresses the tactical application of techniques—non-prescriptive ways or methods used to perform missions, functions, or tasks—associated with the offense and defense during Infantry small-unit mountain operations. Employing the techniques addressed in ATP 3-21.50 requires using and integrating the techniques found in ATP 3-21.8, ATP 3-21.10, and ATP 3-21.20 and the tactics and procedures found in FM 3-96 and FM 3-90. *Tactics* are the employment, ordered arrangement, and directed actions of forces in relation to each other (ADP 3-90). Procedures are standard, detailed steps that prescribe how to perform specific tasks.

The techniques addressed in ATP 3-21.50 includes the *movement*—the positioning of combat power to establish the conditions for maneuver (ADP 3-90)—and *maneuver*—movement in conjunction with fires (ADP 3-90)—of units in relation to each other, the terrain, and the enemy. Techniques vary with terrain and other circumstances; they change frequently as the enemy reacts and friendly forces explore new approaches. Applying techniques usually entails acting under time constraints with incomplete information. Techniques always require judgment in application; they are always descriptive, not prescriptive. The techniques discussed in this publication are useful in most mountain and cold weather regions.

ATP 3-21.50 primarily focuses on Infantry small-unit techniques in mountain operations generally carried out in operational terrain level II and level III, and more specifically, where the influence of increasingly steep and rugged terrain dictates the use of dismounted operations. (See ATP 3-21.10 and ATP 3-21.8 for mountain operations in operational terrain, level I [lower elevation, less rugged valleys, and flatter terrain].)

Fictional scenarios, used as discussion vehicles throughout this publication, illustrate different ways Infantry small units can accomplish their mission regardless of which inherent element (specifically, offense or defense) of conventional or irregular warfare currently dominates. *Conventional warfare* is a violent struggle for domination between nation-states or coalitions of nation-states (ADP 3-0). *Irregular warfare* is the overt, clandestine, and covert employment of military and nonmilitary capabilities by state and non-state actors to achieve policy objectives other than military domination of an enemy, either as the primary approach or in concert with conventional warfare (ADP 3-0). Scenarios focus on potential challenges confronting Infantry small-unit commanders and subordinate leaders in accomplishing a mission but are not intended to be prescriptive of how an Infantry small unit performs any particular operation.

While the Infantry rifle company is an organization not specifically designed for mountain and cold weather operations, it is well suited for this environment. Augmentation with specialized equipment and predeployment training provide the unit with added specialized mountain and cold weather skills and capabilities.

ATP 3-21.50 incorporates the significant changes in Army doctrinal terminology, concepts, constructs, and proven TTP developed during recent operations. The following is a brief introduction and summary of changes by chapter:

Chapter 1—Organization

Chapter 1 provides perspective on how Infantry small units conduct operations in environments characterized by high altitudes, rapidly changing climatic conditions, and rugged terrain. The chapter addresses how the composite of the conditions, circumstances, and influences within mountain and cold weather environments affect small-unit employment capabilities and bear on the decisions made by commanders and subordinate leaders.

Chapter 2—Command and Control

Chapter 2 sets the context for understanding the leadership attributes and competencies vital to exercising command and control (C2) when operating in an environment under harsh mountain and cold weather conditions. It addresses mission command as the Army's approach for the exercise of C2 and defines and describes the relationship between C2. The chapter concludes with a discussion of the operations process specific to combat in mountainous and cold weather regions.

Chapter 3—Offense

Chapter 3 discusses offensive TTP and how the physical characteristics of mountain operations support and enhance offensive operations. Fictional scenarios used within this chapter illustrate different ways Infantry small units accomplish missions during the conduct of offensive mountain operations. Scenarios focus on potential challenges confronting Infantry small-unit commanders and subordinate leaders when operating in an environment under harsh mountain and cold weather conditions.

Chapter 4—Defense

Chapter 4 discusses defensive TTP and how the physical characteristics of mountain operations support and enhance defensive operations. Fictional scenarios used within this chapter illustrate different ways Infantry small units accomplish missions during the conduct of defensive mountain operations. Scenarios focus on potential challenges confronting Infantry small-unit commanders and subordinate leaders when operating in an environment under harsh mountain and cold weather conditions.

Chapter 5—Tactical Enabling Operations and Activities

Chapter 5, specific to mountainous and cold weather regions, addresses tactical movement, establishment of observation posts and combat outposts, tunnel and cave operations, and base camp operations. It addresses considerations for dismounted movements and Soldier load to help establish conditions for the accomplishment of critical tasks during mountain and cold weather operations.

Chapter 6—Augmenting Combat Power

Chapter 6 addresses the integration and synchronization of combat power specific to mountain and cold weather operations. It describes key operations and activities within the elements of combat power (for example, information collection, direct and indirect fires, and aviation fires) to ensure success along with considerations for engineering, protection, and sustainment activities and assets, and special purpose teams, skills, and attachment employment during mountain and cold weather operations.

Chapter 1

Organization

A disciplined and prepared Infantry unit, task organized with and supported by members of a cohesive combined arms team, is the key to successful small-unit mountain and cold weather operations. ATP 3-21.10 and ATP 3-21.8 provide the Infantry small-unit commander and subordinate leader with the basic doctrine to conduct ground combat operations. Chapter 1 provides perspective on how Infantry small units conduct operations in environments characterized by high altitudes, rapidly changing climatic conditions, and rugged terrain. The chapter addresses how the composite of the conditions, circumstances, and influences within maintain and cold weather environments affect small-unit employment capabilities and bear on the decisions made by commanders and subordinate leaders.

SECTION I – OVERVIEW

1-1. Combat in mountainous and cold weather regions is difficult and demanding, both physically and mentally. It calls for extreme physical fitness, mental toughness, endurance, and the utmost in tactical and technical proficiency on the part of commanders, subordinate leaders, and the individual Soldier. A unit fighting in mountainous and cold weather regions must overcome a complicated, ever-shifting set of hazards and difficulties, identify and mitigate risks, and exploit opportunities to close with, and defeat the enemy. Success during operations in mountainous and cold weather environments, like any other environment, depends on a willingness to embrace risk as an opportunity rather than treating it as something to avoid.

1-2. Well-prepared commanders and subordinate leaders anticipate, understand, and adapt to the physical demands of mountain and cold weather regions. They face and overcome the challenges of fighting in areas where technological supremacy can be negated by even the most crude and nontechnical enemy actions. Commanders and subordinate leaders who know what to expect during mountain and cold weather operations create situations that allow their units to adapt to the challenges and achieve victory on the battlefield.

SECTION II – INFANTRY SMALL-UNIT ORGANIZATIONS

1-3. Infantry small-unit organizations, specifically company level and below, are optimized for dismounted operations in mountain terrain and cold weather environments. Commanders and subordinate leaders use terrain and environmental challenges to their advantage during offensive and defensive operations and stability operations tasks. The topography, coupled with mountain climatic conditions, create a unique set of mountain and cold weather considerations. This section addresses considerations for Infantry small units during the conduct of mountain and cold weather operations.

CLOSE COMBAT

1-4. *Close combat* is warfare carried out on land in a direct-fire fight, supported by direct and indirect fires and other assets (ADP 3-0). Mountain combat is often very close in nature as the opposing forces meet in the rugged terrain. Even though engaging targets near the limits of direct fire weapons does occur in mountain engagements, intervening crest, hills, ridges, gullies, depressions, and other terrain features often limit long range battles with the enemy. The upper levels of mountainous terrain are characterized by a lack of trafficable roads and degraded aviation capabilities. Use of motorized vehicles is often restricted due to climatic conditions, forcing mission execution to dismounted units. Close combat in mountainous terrain and cold weather is normally characterized by—

- Decentralized small-unit operations.
- Degraded mobility and increased movement times.
- Continuous all-around security.
- Integrated air assets.

DECENTRALIZED SMALL-UNIT OPERATIONS

1-5. Conflicts in mountainous terrain are often fought on a platoon and squad level, as the terrain commonly will not support the meeting and maneuver of larger units. The compartmentalization of mountain terrain can separate battalions from a brigade, companies from a battalion, and platoons from a company for long periods. Rugged, steep terrain that restricts mobility to foot movements requires even small units into a column/file (see ATP 3-21.8) type formation during movement. As altitude increases in mountain environments, the increasingly restricted terrain makes movement and maneuver more difficult thereby driving the need for decentralized operations by dismounted platoons and squads.

1-6. Mountain operations, normally characterized by noncontiguous assigned areas, require centralized planning and decentralized execution specifically command and control (C2). Mountain terrain can span vast regions often with great distances between populated areas. Infantry units operating in this terrain are often separated by long distances. In addition, compartmentalization of valleys and corridors due to high ridges and mountain peaks naturally divides the terrain and complicates movement between compartments. While companies may operate as part of a larger force, combat engagements in higher-level mountain terrain tend to be conducted by small units.

DEGRADED MOBILITY AND INCREASED MOVEMENT TIMES

1-7. The ruggedness of mountain terrain and climatic conditions often restricts mobility to foot movements using column type formations (see paragraph 1-5) and slower movement times. Mountain terrain and cold weather conditions not only limit mounted movements, but also often restrict dismounted movements to roads and trails. A relatively short distance from point to point may be an arduous movement over steep, rocky, uneven terrain with multiple trail switchbacks, and snow conditions that increase the distance and time traveled and the energy expended to traverse the terrain. (See ATP 3-21.18 for additional information on dismounted movements.)

1-8. Reduced mobility, compartmented terrain, limited visibility in critical areas, and rapidly changing weather conditions increase the importance of reconnaissance and surveillance (R&S) in mountainous terrain and cold weather environments. Since the enemy can easily be concealed in a mountain environment, all available reconnaissance forces and surveillance assets should be employed to gain as much information as possible. Maps are frequently inaccurate or lacking in detail, making reconnaissance of an assigned area essential to develop an accurate description. Along with conventional R&S units and Soldiers, excellent sources of information include aircraft crews, echelon-specific unmanned aircraft system (UAS) platforms, and other units and personnel (examples include, special operations forces and host-nation partners) moving through or operating in a particular area. Large amounts of dead space require R&S by some means to aid in operations.

CONTINUOUS ALL-AROUND SECURITY

1-9. Infantry small units, during the conduct of mountain operations, must maintain continuous all-around security. During movement and maneuver, an overwatch force positions itself on terrain that provides them cover and allows them to cover the positioning and movement of a maneuvering force. These forces may bound with the moving force or may be inserted by other means such as helicopters. When in a defensive position, ground patrols, observation posts (OPs), remote sensors, and other aerial and ground surveillance assets help provide security both during the day and during periods of limited visibility. Mountainous terrain provides great opportunities for enemy ambush. Detailed planning of routes, control of terrain suited for an ambush, and preparation for actions on contact (see Maneuver Center of Excellence echelon-specific Infantry Army technique publications for additional information) must accompany every movement. Infantry small units must also consider the potential threats imposed from the natural air avenues of approach that traverse their area of operations (AO).

INTEGRATED AIR ASSETS

1-10. Fixed-wing and rotary-wing or tiltrotor aircraft are vital combat assets in mountain operations. Planning for the use of supporting fires from air assets in conjunction with field artillery and mortar indirect fires is critical for offensive and defensive operations in mountainous terrain. Air assets can attack targets in areas difficult or impossible to reach by ground direct or indirect fires. Air assets are also used extensively for

tactical R&S, and movement of Soldiers and supplies. Helicopters are commonly used in air assault operations to insert quickly and pick up personnel in difficult mountain terrain. Air delivery of supplies is often the only feasible means of resupply to units operating at high altitudes in rough mountain terrain. Various restrictions such as weather, security and safety, cargo size, and number of personnel transported can be limiting factors and make operations difficult. Units conducting mountain and cold weather operations must coordinate with supporting aircrews prior to mission execution to ensure planning considerations address terrain and weather restrictions to air operations.

OPERATIONAL INFLUENCES

1-11. Operational influences, specifically terrain and weather conditions, found in mountainous regions demand modifications to tactical operations conducted on flatter, less rugged and less demanding terrain and weather conditions. In addition to widespread operations across great distances and multiple corridors, mountain operations include a vertical, as much or more, than a horizontal dimension. Engagements between enemy and friendly forces often occur with elements at different elevations, requiring the application of unique tactics, techniques, and procedures (TTP). Predictable, yet extreme, weather patterns may require units plan and conduct seasonal operations.

TERRAIN AND WEATHER CONDITIONS

1-12. Mountain ridges and terrain features that overlook the terrain below can be used to influence operations greatly at those lower levels from both a friendly and enemy perspective. Higher ground often becomes key terrain and must be controlled by friendly forces to enhance offensive and defensive operations, and stability operations tasks (specifically, area security and security missions).

1-13. Drastically changing weather conditions equally influence operations. Understanding current and potential weather conditions helps commanders visualize how weather may be used during mission planning for combat operations. Sudden or unexpected snowstorms, fog, rain, and other climatic conditions may impede planned operations but may also be used to aid in masking movements or creation of natural obstacles.

UNIQUE SUSTAINMENT SOLUTIONS

1-14. Sustainment in mountainous and cold weather regions is a challenging, time-consuming process. These regions complicate virtually all sustainment operations including logistics resupply, medical and casualty evacuation (CASEVAC), and Soldier health and hygiene. The network of restrictive mountain roads often does not support resupply vehicles with a large turning radius or permit two-way traffic. Movement of supplies often involves a combination of surface (road, rail networks, and waterways) and air modes including rotatory-wing and fixed-wing aircraft. These modes along with techniques (for example, employment of animals, on-foot, use of host-nation assets for transportation needs) have their own challenges in mountainous and cold weather regions (see paragraph 6-201).

OPERATIONS IN THINLY POPULATED AREAS

1-15. The populace in typical mountainous regions lives mostly in small villages in the valleys with some scattered villages in the upper mountain areas. Although the farmers and animal herders that make up a large majority of the indigenous population may work up into the mountains, a vast amount of mountain terrain remains unpopulated.

ADVANTAGES AND DISADVANTAGES

1-16. Mountain and cold weather region conditions can be both an advantage and a disadvantage to either friendly or enemy forces. If unprepared, the terrain, as well as the enemy, can be a unit's adversary. Soldiers must prepare mentally and physically, and commanders and subordinate leaders must prepare tactically and logistically to conduct missions in mountain and cold weather regions effectively. Commanders and subordinate leaders must understand the physical and climatic characteristics and conditions of a region. They must know how the region's terrain and weather can be used to their advantage.

CAPABILITIES AND LIMITATIONS

1-17. Operations conducted in the upper levels of mountainous terrain and cold weather regions, by nature, severely limit or restrict vehicular movement and normally require dismounted operations. Mounted units assigned missions in mountainous terrain will similarly have to dismount to complete the mission, using their vehicles for mission support when possible. Often only minor modifications to an Infantry unit's organic equipment are required for specific missions in mountainous regions. These usually take the form of special clothing and equipment needed for steep terrain or cold weather. Table 1-1 addresses an Infantry small-unit's capabilities and limitations during the conduct of mountain and cold weather operations.

Table 1-1. Capabilities and limitations during Infantry small-unit operations

Capabilities	*Limitations*
-Conduct offensive and defensive operations. -Seize, secure, occupy, and retain terrain. -Destroy, neutralize, suppress, interdict, disrupt, block, canalize, and fix enemy forces. -Breach enemy obstacles. -Conduct feint or demonstration to deceive the enemy. -Provide security for friendly units. -Reconnoiter, deny, bypass, clear, contain, and isolate. (These tasks might be oriented on both terrain and enemy.) -Conduct decentralized platoon and squad operations. -Participate in air assault operations. -Operate in conjunction with special operations forces. -Move across difficult terrain.	-Vulnerable to enemy artillery and air assets. -Vulnerable to chemical, biological, radiological, or nuclear attacks. -Limited decontamination capability. -Slow movement in rocky, steep, and uneven terrain. -Vulnerable to fatigue in high altitudes. -Increased sustainment challenges. -Vulnerable to sudden changes in weather and temperature, as well as severe weather conditions (for example, blizzards).

SECTION III – ENVIRONMENTAL CONSIDERATIONS

1-18. For those Infantry small units trained in how to operate in mountain and cold weather environments effectively, they not only survive but also prosper when their training is used as a combat multiplier. Though mountain and cold weather environments can be extremely intimidating, units can fight and win in these environments with proper preparation and training. Such preparation and training include understanding the physical characteristics of the operational environment and its effects on operations and a unit's ability to adapt. Realistic and challenging training can prepare Soldiers for the rigors of mountain and cold weather warfare, allowing them the opportunity to develop the discipline and confidence that operating in the mountains or cold environments demand. The following discussion focuses on those elements in the first two steps of the intelligence preparation of the operational environment (IPOE) process (define the operational environment and describe environmental effects on operations, respectively) that pertain to the physical characteristics of mountainous and cold weather environments and their effects on Infantry small-unit operations. (See ATP 3-90.97 and TC 3-97.61 for additional information.)

OPERATIONAL AND MISSION VARIABLES

1-19. *Operational variables* is a comprehensive set of information categories used to define an operational environment (ADP 1-01). These information categories are political, military, economic, social, information, infrastructure, physical environment, and time (also called PMESII-PT). Division and higher-level staffs conduct and provide an analysis of operational variables to the staffs at the brigade combat team and battalion echelon. While each environmental analysis is unique, especially as it applies to a particular enemy and mission, there are some environmental aspects that apply to most mountain and cold weather environments, specifically the physical environment.

1-20. *Mission variables*, the categories of specific information needed to conduct operations (ADP 1-01), focus on specific elements of an operational environment during mission analysis. When units conduct combat operations in mountainous and cold weather regions, they use techniques consistent with the mission variables of METT-TC (I), which stands for mission, enemy, terrain and weather, troops and support

available, time available, civil considerations, and informational considerations. The staffs at the brigade combat team and battalion echelon (see FM 3-96, chapter 3 and ATP 3-21.20, appendix B) develop information specific to a particular environment throughout mission analysis and provide the analysis to subordinate units (company and below). The composite of the conditions, circumstances, and influences within an operational environment affect small unit employment capabilities and bear on the decisions made by commanders and subordinate leaders. The operational environments of mountainous and cold weather regions include information and people as well as physical areas.

Note. METT-TC (I) represents the variables leaders use to analyze and understand a situation in relationship to the unit's mission. The first six variables are not new. However, the increased use of information (both military and civilian) to generate cognitive effects requires leaders to assess the informational aspects and impacts on operations continuously. Because of this, informational considerations, represented with (I) has been added to the familiar METT-TC mnemonic. Informational considerations are expressed as a parenthetical variable in that it is not an independent variable, but an important component of each variable of METT-TC that leaders pay particular attention to when developing understanding of a situation. (See FM 6-0 for additional information.)

1-21. Mission variables, used during mission analysis at the company echelon (see ATP 3-21.10, appendix B), describe the operational environment and are used by commanders and subordinate leaders to understand and analyze the environment in which they are conducting operations. These mission variables describe not only the military aspects of the operational environment but also the population's influence on it. During the IPOE, the mission variables of enemy, terrain, weather, and civil considerations are used to analyze an AO to determine their effect on operations. While most of the variables can only be discussed as they pertain to a specific mountain environment, a discussion of the physical environment including the terrain, climate, and general discussion of the mountain population can be applied to all mountainous and cold weather region environments.

PHYSICAL CHARACTERISTICS

1-22. Historical and present imperatives illustrate the need for the Army's continued focus on mountain doctrine and training when conducting expeditionary operations in mountainous and cold region environments. Current threat estimates indicate numerous nation state interests have regions with elevations equal to or greater than 2,438 meters (8,000 feet). Current and projected threats in many of these countries center on small and irregular forces operating in rugged, compartmentalized terrain. These forces use the inherent advantages that mountainous terrain and weather offer, negating U.S. technological advantages in information collection and firepower. Therefore, the ability to conduct Infantry small-unit operations in both large- and small-scale contingencies, against conventional and irregular, non-state actors is paramount. (See ATP 3-90.97 and TC 3-97.61 for additional information.)

MOUNTAIN ENVIRONMENTS

1-23. The principal mountain ranges of the world lie along the broad belts shown in figure 1-1 on page 6. Called cordillera (the Spanish word for mountain range, originating from the Latin word "chord," for rope in English), these ranges encircle the Pacific basin and then lead westward across Eurasia into North Africa. Secondarily, chains of mountains lie along the Atlantic margins of the Americas and Europe. These ranges are no less rugged than the cordillera around the Pacific. Different mountain chains have different types of climates. Some chains are located in dry desert regions with temperatures ranging from extreme heat in the summer to extreme cold in the winter. In tropical regions, small to medium mountains are covered in lush jungles with deep ravines that flood during the rainy season. Temperatures in these areas typically remain warm and humid all year. Many of the mountains in Central America and many mountainous regions in Africa and South America that are located close to the equator have these characteristics. Conversely, high mountains in temperate climates have sparse vegetation at elevations above 3,505 meters (11,500 feet) and temperatures that drop below freezing in winter. Some mountainous regions have a variety of environments, such as in Afghanistan where Army forces encounter several different mountain environments within the same AO.

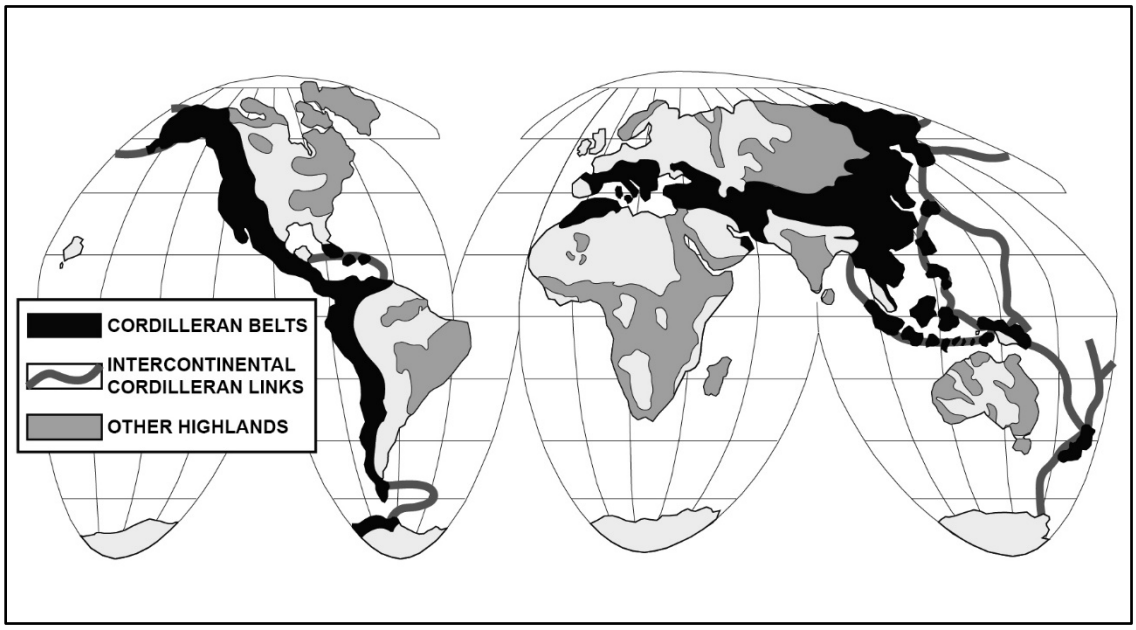


Figure 1-1. Mountainous regions of the world

Mountain Terrain

1-24. Mountains may rise abruptly from the plains to form a giant barrier or ascend gradually as a series of parallel ridges extending unbroken for great distances. Mountains may have isolated peaks, rounded crests, eroded ridges, and high plains and be cut by valleys, gorges, and deep ravines. In general, low mountains have an elevation of 152 to 914 meters (500 to 3,000 feet) with summits usually below the timberline. High mountains exceed 1,829 meters (6,000 feet) and are characterized by barren alpine zones above the timberline. Glaciers and perennial snow cover are common in high mountains and usually present commanders with more obstacles and hazards to movement than do low mountains. High rocky crags with glaciated peaks and year-round snow cover exist in mountain ranges at most latitudes along the western portion of the Americas and in Asia. Regardless of their appearance, rugged terrain is common among all types of mountains.

1-25. Mountain slopes generally vary between 15 and 45 degrees. Cliffs and other rocky precipices may be near vertical or even overhanging. Aside from obvious rock formations and other local vegetation characteristics, actual slope surfaces are relatively firm earth or grass. Grassy slopes may include grassy clumps (tussocks), short alpine grasses, or tundra. Tundra is more common at higher elevations and latitudes. Many slopes may be scattered with rocky debris deposited from the higher peaks and ridges. Slopes covered with smaller rocks, usually fist-sized or smaller, are called scree fields. Slopes covered in talus are often an easy ascent route. On the other hand, climbing a scree slope is difficult because the small rocks tend to loosen easily and give way. Hills are often covered with trees and bushes below the timberline. In winter and spring, the sun dries out southern mountain slopes—leaving less water for plant life to flourish. Because the northern side of a hill tends to hold more water, vegetation is generally thicker. On gentle slopes, trees may also be thicker but as the slope increases, trees become more widely spread.

1-26. In winter and at higher elevations throughout the year, snow covers slopes, creating an environment with its own distinct effects. Some snow conditions aid travel by covering rough terrain with a consistent surface. Deep snow, however, impedes movement and requires Soldiers to be well-trained in using snowshoes, skis, and over-the-snow vehicles. Steep, snow-covered terrain presents the risk of snow avalanches as well. Snow can pose a serious threat to Soldiers not properly trained and equipped for movement under such conditions. Avalanches have taken the lives of more Soldiers engaged in mountain warfare than all other terrain hazards combined.

Mountain Classification

1-27. There is no simple system to classify mountainous environments. Soil composition, surface configuration, elevation, latitude, and climatic patterns determine the specific characteristics of each environment. Commanders and leaders should first understand the characteristics of mountain terrain to determine their application to combat operations. For the purposes of U.S. Army military operations, mountains are classified as landforms that rise more than 500 meters (1,640 feet) above the surrounding plain and are characterized by steep slopes. Mountains may consist of an isolated peak, single ridges, glaciers, snowfields, compartments, or complex ranges extending for long distances and obstructing movement. Mountain operations are generally carried out at three operational terrain levels (see figure 1-2).

1-28. Level I terrain is located at the bottom of valleys and along the main lines of communications. At this level, mounted forces can operate, but maneuver space is often restricted. Dismounted and mounted forces are normally combined, since vital lines of communication usually follow the valley highways, roads, and trails. Most, but not all, of the civilian population is found at this level.

1-29. Level II terrain lies between valleys and shoulders of mountains. Generally, narrow roads and trails, which serve as secondary lines of communication, cross this ridge system. Ground mobility is difficult. Additionally, since dismounted forces can easily influence operations at level I from level II, they often expend great effort on these ridges. Similarly, enemy positions at the next level can threaten operations on these ridges. The enemy can often find sanctuary at this level in the form of bunkers and caves.

1-30. Level III includes the dominant terrain of summit regions. Although summit regions may contain relatively gentle terrain, mobility in level III is usually the most difficult to achieve and maintain. Level III terrain can provide opportunities for well-trained units to attack the enemy from the flanks and rear. At this terrain level, acclimatized Soldiers with proper skills and equipment can infiltrate to attack lines of communication, logistics bases, air defense sites, and C2 facilities.

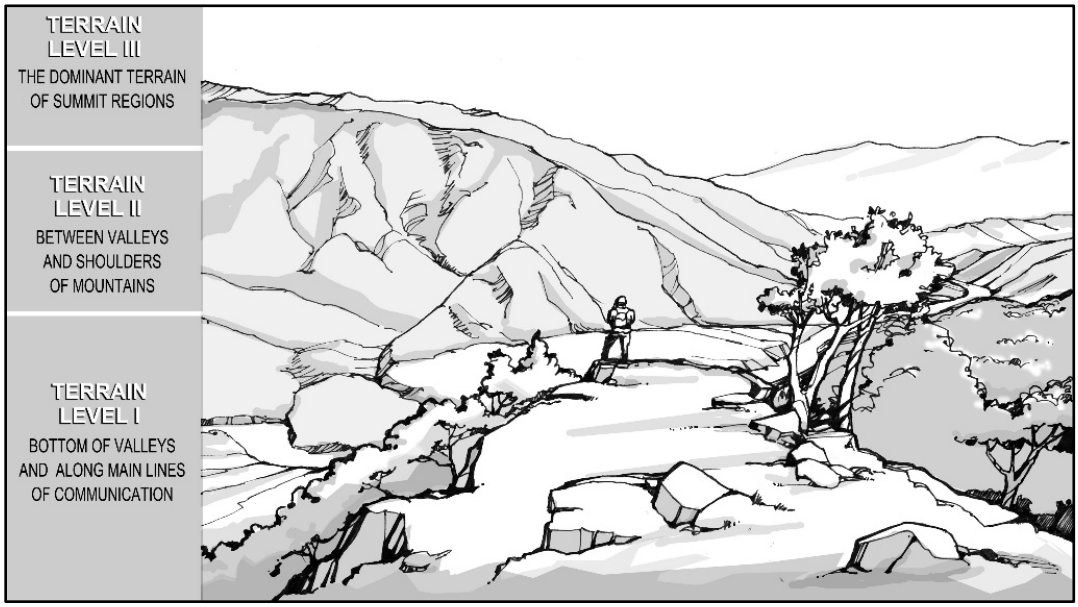


Figure 1-2. Operational terrain levels

Terrain Characteristics

1-31. Mountains may rise abruptly from the plains to form a giant barrier or ascend gradually as a series of parallel ridges extending unbroken for great distances. They may consist of varying combinations of isolated peaks, rounded crests, eroded ridges, high plains, cut valleys, gorges, and deep ravines. Major mountain ranges are extremely complex. Regardless of the specific type, mountain terrain is considered rugged. Mountain terrain is characterized in terms of hydrological (water) data, elevation data, soil composition, and vegetation.

Note. *Complex terrain* is a geographical area consisting of one or more of the following: an urban center larger than a village, or two or more types of restrictive terrain or environmental conditions occupying the same geographic location (ATP 3-34.80).

1-32. Mountains are home to many water sources including freshwater springs, lakes, and streams. Mountain streambeds may be dry or contain a significant amount of water. Smaller streambeds often feed into larger ones at roughly perpendicular angles and are fed by mountain springs, and runoff from melting snow or rain. Flash floods from storms in mountain streambeds are common.

1-33. During operations at higher elevations, in the winter and throughout the year, snow may blanket slopes, creating an environment or condition of its own. Steep snow-covered terrain presents a risk of snow avalanches. Arctic and subarctic mountain environments, as well as the upper elevations of the world's high mountains, may contain vast areas of glaciation. Valleys in these areas are frequently buried under massive glaciers and present hazards, such as hidden crevices.

1-34. Mountains have a natural lay of the land that separates distinct sections of terrain. They can be very steep making the terrain exceptionally difficult to traverse. Slopes commonly range from 15 to 45 degrees. Cliffs and precipices may be vertical or overhanging. Mountain ridges, valley floors, and intervening hills and crests naturally break the region up into smaller compartments and channel movement through naturally created corridors. Mountain peaks can range to very high elevations with their surfaces generally composed of varying combinations of rock, snow, and ice.

1-35. Mountain ground is usually rocky consisting of various types of rocks. These rocks can be loose and unstable and formed on varying degrees of slopes compounding movement across them. Many slopes are scattered with rocky debris deposited from the higher peaks and ridges.

1-36. While trees and vegetation are commonly found at or near the base of mountains, on ascending slopes, and lower ridges and hilltops, there is a certain elevation past which they cannot thrive. This elevation, characterized by cold temperatures, insufficient air pressure, and lack of moisture, is known as the timberline. Depending on the latitude and region, the timberline generally occurs between 2,300 and 4,000 meters (7,500 and 13,000 feet). In the Hindu Kush Mountains in Afghanistan, for example, the timberline occurs at approximately 3,300 meters (10,800 feet).

COLD ENVIRONMENTS

1-37. For military purposes, cold regions are defined as any region where cold temperatures, unique terrain, and snowfall have a significant effect on military operations for 1 month or more each year. About one quarter of the earth's land mass may be termed as severely cold. (See figure 1-3.) This area, indicated by the area above line A in the Northern Hemisphere and below line A in the Southern Hemisphere, means annual air temperatures stay below freezing, maximum snow depths exceed 60 centimeters (24 inches), and ice covers lakes and rivers for more than 180 days each year. Another quarter of the earth is termed moderately cold. In figure 1-3, this area fits between lines A and B (including most of the United States and Eurasia). Its mean temperatures during the coldest month are below freezing.

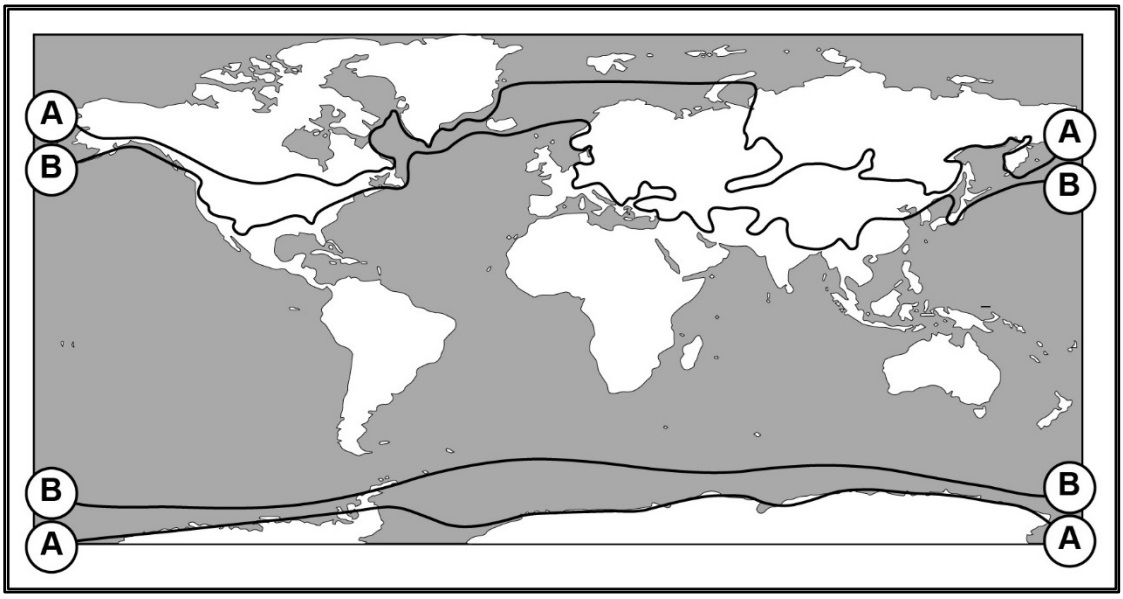


Figure 1-3. Cold regions of the world

MOUNTAIN INFLUENCED COLD REGION

1-38. Variations in climate that exist in cold regions result from mountainous terrain. Mountain terrain can cause a vertical change in weather called a zonation and may cause differences in weather on the windward and leeward side of the mountain. Mountains can complicate operations in cold regions. Commanders and subordinate leaders treat all mountains and mountainous regions that receive a predictable amount of snowfall as a cold region. Many tasks needed to operate successfully in cold regions apply to mountain regions but operating in mountainous terrain requires specialized training (see TC 3-97.61 for more information). Factors such as slope, soil composition, and surface configuration differentiate mountain operations from other mountain and cold weather operations. (See the discussion on mountain environments, paragraphs 1-23 to 1-36.) The most significant factor to affect individual performance is altitude. Performance starts to degrade after personnel ascend to elevations over 5,000 feet (1,500 meters).

Mountain Climate

1-39. Equal to an understanding of terrain characteristics, leaders should know the characteristics of mountain climates before determining their military application. By understanding mountain climate characteristics, leaders can take advantage of the opportunities offered by current weather conditions while minimizing the adverse effects on operations and personnel.

1-40. Mountain climates are characterized in terms of visibility, wind velocity, precipitation, cloud cover, temperature, humidity, and atmospheric pressure. These mountain climates often span a wide range of conditions that may include strong winds, thin air, intense solar and ultraviolet radiation, deep snow, raging thunderstorms, blizzards, heavy fog, and rapidly changing weather. Weather conditions can change suddenly and unexpectedly in the mountains and temperatures at high altitudes can range from very hot to extreme cold in the course of 1 day. Severe storms can cut off outside contact for a week or longer. Avalanches and rockslides are common. In addition, mountains can create their own microclimates or areas in which the climate differs from the prevailing climate in the surrounding area.

Visibility

1-41. Light data charts can provide times for sunrise, sunset, and morning and evening twilight hours for the local area. Other factors that impact visibility include weather conditions such as rain, snowstorms, clouds, and fog. Fog in mountains is much the same as in other terrain but occurs more frequently and can remain for long periods. Mountain winds often result in blowing snow, sand, or debris further impairing visibility. On clear days, high elevations provide for opportunities to see great distances.

Wind Velocity

1-42. Valleys are usually protected from strong winds while ridges and passes of mountains are seldom calm. Wind velocity generally increases with altitude and is intensified by mountain terrain. Valley breezes moving up a slope are more common in the morning, while descending mountain breezes are more common in the evening. Wind speed increases when winds are forced over ridges and peaks or when funneled through narrowing mountain valleys, passes, and canyons. Exposed mountainsides and summits are especially subject to strong winds.

Precipitation

1-43. As mountain elevation increases, so does the amount of precipitation. Mountain ranges set natural conditions that cause a rapid rise of large amounts of air. As this air rises, the decrease in atmospheric pressure and temperature causes frequent rain and thunderstorms. As it continues to pass over mountains, it creates distinct local weather patterns. Precipitation also occurs more often on the windward side of mountain ranges than on the leeward side. A heavily wooded belt usually marks the zone of maximum precipitation. Snow is common in the mountains and whether it occurs depends on the latitude, elevation, and season. Heavy rains and rapidly thawing snow and ice can create flash floods many miles downstream from the actual location of the rain or snow.

1-44. Inclement weather can appear quickly and change the nature of planned operations with little notice. Indicators of approaching inclement weather (within 24 to 48 hours) include—

- A gradual lowering of clouds.
- An increasing halo around the sun or moon.
- An increase in humidity or temperature.
- A decrease in barometric pressure.
- Strong winds (blowing snow off peaks).

1-45. Local thunderstorms usually last only a short time. Interior ranges with continental climates are more conducive to thunderstorms than coastal ranges with maritime climates. In alpine zones, driving snow and sudden wind squalls often accompany thunderstorms. Ridges and peaks become focal points for lightning strikes, and the occurrence of lightning is greater in the summer than the winter.

1-46. Storms resulting from widespread atmospheric disturbances often involve strong winds and heavy precipitation and are the most severe weather condition that occurs in the mountains. These conditions may last several days longer than in the lowlands. Specific conditions vary depending on the path of the storm. Colder weather impedes clearing of these storms at high elevations. Winter storms in alpine regions are usually accompanied by low temperatures, high winds, and blinding snow.

Cloud Cover

1-47. Clouds are common in mountain environments and may form quickly. Unlike lower elevations, clouds may come in contact with a portion of the mountain. Clouds are formed when warm air blowing against the side of a mountain is forced up and cools. These clouds often lead to rain or snowstorms.

Temperature

1-48. Air temperature decreases as elevation increases in the mountains. Wind and other climatic conditions also have an effect on mountain environment temperatures. Mountain microclimates create conditions where temperatures may range from scorching hot during the day to below freezing at night.

Humidity

1-49. Humidity in mountain environments is often lower than at sea level. At higher elevations, air is considerably drier because cold air cannot hold as much moisture as warm air.

Atmospheric Pressure

1-50. Atmospheric pressure decreases with an increase in elevation. The decrease in atmospheric pressure spreads oxygen molecules further apart, resulting in a decrease of oxygen in each breath a person takes. A decrease in air pressure results in a decrease in air temperature and an increase in relative humidity.

Mountain Population

1-51. The populace in a mountain environment can include civilian as well as government and military personnel. A large majority of the indigenous population in mountain environments are rural people such as farmers and animal herders that live mostly in small villages in the valleys. Enemy personnel can easily blend into this population.

1-52. Host nations may have a variety of government and military personnel with which U.S. Forces must operate. In Afghanistan for instance, the Afghan National Security Forces include the Afghan National Army, the Afghan National police, and Afghan security guards.

EFFECTS ON INFANTRY SMALL-UNIT OPERATIONS

1-53. Mountain terrain and weather impact nearly every aspect of mountain operations. The effects of mountain terrain on mobility and movement are covered in detail in chapter 5 of this publication. The physical characteristics of mountains—

- Affect mobility and lengthen movement times.
- Physically and mentally tax Soldiers.
- Affect some weapons operations and accuracy.
- Challenge sustainment operations.
- Create hazards and risks.
- Complicate medical evacuation (MEDEVAC) and CASEVAC operations.
- Interfere with line of sight (LOS) communications.
- Challenge C2.

1-54. In preparation for combat, commanders should consider the following list of specialized operations, procedures, and techniques specifically focused on operations in mountain terrain that may be required:

- Basic climbing techniques.
- Mountain navigation.
- Mountain stream crossing.
- Long-range angle-firing techniques.
- Mountain terrain route selection.
- Off road and steep terrain driving.
- Use of ropes (fixed ropes, high lines, and basic installations).
- Procedures to avoid landslides and avalanches.
- Use of animal transport for weapons and logistical items.
- Walking and movement techniques for steep and rough terrain.
- Cold weather movement (snowshoe movement and sled operations).
- Mountain survival techniques.
- Hazardous cross-country night movement.
- Advanced first aid.
- Personal hygiene and field sanitation.
- Small-unit standard operating procedures (SOPs) and immediate action drills.
- Rough terrain or steep earth CASEVAC.
- Landing zone (LZ) and pickup zone selection and control in restrictive terrain.

1-55. Commanders focus their operational analysis on specific elements of the environment that apply to their particular mission. Upon receipt of a mission, they narrow their focus to the mission variables (see paragraph 1-20). The mission variables of METT-TC (I) are used to conduct mission analysis. Commanders conduct detailed terrain and weather analysis, as well as an analysis of the other mission variables, for each mission.

1-56. Mountain environments affect all of warfighting functions (C2, movement and maneuver, intelligence, fires, sustainment, and protection). These effects are discussed throughout the remaining chapters of this publication as they apply to one or more of the warfighting functions.

Chapter 2

Command and Control

Command and control is the exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission (JP 1, Vol 2). Commanders exercise their authority through decision making and leadership. Through command and control (C2), commanders provide purpose and direction to integrate all military activities towards a common goal—mission accomplishment. This chapter sets the context for understanding the leadership attributes and competencies vital to exercising C2 when operating in an environment under harsh, mountain and cold weather conditions. It addresses mission command as the Army's approach for the exercise of C2 and defines and describes the relationship between C2. The chapter concludes with a discussion of the framework specific to operations in mountainous and cold weather regions.

SECTION I – LEADERSHIP

2-1. *Leadership* is the activity of influencing people by providing purpose, direction, and motivation to accomplish the mission and improve the organization (ADP 6-22). Leadership is a critical component to successful operations in mountain and cold weather regions. It is the unifying and multiplying element of combat power. Commanders and small-unit leaders lead through a combination of personal example, persuasion, and compulsion. They employ leadership to translate decisions into effective action by forces.

THE IMPORTANCE OF COMPETENT LEADERSHIP

2-2. During operations in mountain and cold weather regions, no amount of technology or equipment can take the place of competent leadership. Competent leaders understand the unique characteristics of mountains and weather and the demands of mountain and cold weather environments. Leaders must recognize and address physical and mental fatigue in their Soldiers. In mountain and cold weather environments, small mistakes can lead to catastrophic events. Leaders must ensure Soldiers maintain mental alertness and pay attention to detail during all operations. Loss of concentration during a difficult mountain climb or movement within a severe cold weather environment, for example, may cause unit personnel to overlook suspicious signs of enemy personnel or activity, or could lead to a slip and fall down a steep mountain cliff resulting in serious injury.

CHALLENGES WITHIN MOUNTAINOUS TERRAIN

2-3. Distances between parent and subordinate units can be great in mountainous terrain and the demand for leaders to exercise leadership, decision-making, and disciplined initiative becomes increasingly challenging. In conflicts involving noncontiguous assigned areas, the commander and subordinate leaders at company level and below often have expanded responsibility in a particular location far removed from a neighboring unit or higher command. This environment demands that leaders take charge, manage their personnel, and maintain mental toughness beyond what they experience in many other environments.

2-4. During mountain operations, leaders often direct command post (CP) operations and conduct missions while separated by great distances from their parent unit for extended periods. They are required to make tough choices between their Soldiers' physical capabilities and mission accomplishment. Leaders who have previously served in mountainous and cold weather regions are a great source of information for leaders with no or less experience in these environments as they already understand what it takes to plan, prepare, execute, and assess missions in these environments.

2-5. Leaders must understand the capabilities, limitations, and employment of weapons systems, platforms, and resources to use them effectively. These include sniper teams, artillery, mortars, forward observers, Army aviation, close air support (CAS) aircraft, echelon-specific unmanned aircraft system (UAS) platforms (to include UAS firing platforms), and other attachments such as civil affairs teams, psychological operations

teams, human intelligence (HUMINT) teams, signals intelligence (SIGINT) teams, military information support operations teams, military police, engineers, explosive ordnance disposal teams, and interpreters.

EXTREME WEATHER AND TEMPERATURE CONDITIONS

2-6. A unique challenge for leaders in a mountain environment is the potential for operations in extreme weather and temperature conditions. The process of developing Soldiers into cold weather fighters requires positive leadership. Leaders must understand the environmental threat and include plans for countering that threat in their operational plans or tactical standard operating procedures (SOPs). Initially, the environment may be alarming and even frightening to Soldiers unaccustomed to operating in typical mountain weather conditions, especially when deployed to unfamiliar, remote areas. Some Soldiers may find themselves confronted with challenges they have never encountered. The weather is a constant reminder to Soldiers of their vulnerability in extreme environments and the likelihood of becoming a casualty should they make a mistake. As Soldiers gain experience, they develop confidence in themselves, their clothing, and their equipment, and learn they can fight and win in these type environments—defeating both the environment and the enemy.

2-7. Aggressive, positive leadership is essential in helping Soldiers overcome the challenges of adverse weather. To defeat the enemy, Soldiers should first overcome by learning how to live and survive the elements so they can focus on the enemy. Leaders should maintain a positive attitude toward the mission, their Soldiers, and their equipment.

2-8. Intense weather affects the mind as well as the body. For example, in extreme cold temperatures, Soldiers can become frustrated and mentally exhausted while attempting to perform tasks and keep warm at the same time. Essential tasks often take longer to perform and require more effort than in temperate climates. The time and effort it takes to accomplish essential tasks are major considerations when planning operations and giving orders. Even routine tasks such as vehicle maintenance and making or striking camp requires an increase in time. There is no simple formula for the extra time required to accomplish tasks. The time needed varies with differing conditions, the state of training, and the degree of acclimatization of the Soldiers. The time needed should not be used as an excuse for over-insurance—Soldiers readied unnecessarily early or left standing in the open after striking camp may suffer physically. Such overcompensation can affect Soldier morale.

SECTION II – MISSION COMMAND

2-9. *Mission command* is the Army's approach to command and control that empowers subordinate decision making and decentralized execution appropriate to the situation (ADP 6-0). Mission command requires that commanders and subordinates accept risk, exercise disciplined initiative, and act decisively, even when the outcome is uncertain. Applying the mission command approach to the conduct of small-unit combat operations (to include training events) in environments characterized by high altitudes, rapidly changing climatic conditions, and rugged terrain creates the cultural foundation for the unit's employment in high-risk environments.

2-10. Mission command helps commanders capitalize on subordinate decision making to achieve the commander's intent when conditions change, or current orders are no longer relevant. It requires subordinates who seek opportunities and commanders who balance risk for subordinates trying to meet their intent. Subordinate decision making and decentralized execution appropriate to the situation help manage uncertainty and enable necessary tempo at each echelon across the range of military operations.

2-11. In mountainous and cold weather regions, compartmentalized terrain, expansive area of operations (AO), and severe environmental conditions limit C2 systems and challenge C2 efforts. Large operational areas and the need to employ small-unit tactics require commanders to decentralize and disperse their forces. Commanders rely on decentralized execution enabled by centralized planning, mission orders, and clear commander's intent. During war-gaming, commanders anticipate conditions and future environmental events by thinking about branches and sequels instead of focusing on details better handled by subordinates during current operations. Subordinates empowered to make decisions during operations unburden commanders from issues that distract from necessary broader perspective and focus on critical issues. The Army's

approach to C2, allows those commanders and subordinate leaders with the best situational understanding to make rapid decisions without waiting for higher echelon commanders to assess the situation and issue orders.

2-12. Commanders delegate appropriate authority to subordinates based upon a judgment of their capabilities and experience. Delegation allows subordinates to decide and act for their commander in specified areas. Delegating decision-making authority to subordinates reduces the number of decisions made at a higher echelon and reduces response time at lower echelons. When delegating authority to subordinates, commanders strive to set the necessary conditions for success for their subordinates by managing the missions they assign and the resources they provide. Commanders allocate enough resources for the missions they assign. These resources include information, forces, materiel, and time.

2-13. While commanders can delegate authority, they cannot delegate responsibility. Subordinates are accountable to their commanders for the use of delegated authority, but commanders remain solely responsible and accountable for the actions of their subordinates. Risk and moral hazard should migrate upward to the higher echelon commander and never be pushed down onto subordinates. Risk management (RM) integration is critical at each level of command in all phases of mountain and cold weather operations to identify and mitigate hazards to enhance mission success. The following considerations apply to C2 in mountain and cold weather regions as well as in all operations:

- Warning orders that allow subordinates ample time to prepare and plan for operations.
- Mission orders that empower subordinates and promote freedom of action.
- Commander's intent that clearly articulates the purpose, key tasks, and desired end state.
- Command relationships that are clearly understood and facilitate the exercise of disciplined initiative by subordinates (unity of command where possible, unity of effort where it is not).
- Unit SOPs that are adopted, understood, and applied across the command.

SECTION III – RELATIONSHIP BETWEEN COMMAND AND CONTROL

2-14. C2 are interrelated—the focal point of C2 is the commander. Commanders assess situations, make decisions, and direct action. They provide purpose, direction, and motivation to instill the will to win. Commanders seek to understand the situation, visualize an end state and operational approach, and describe that end state and operational approach in their commander's intent and planning guidance.

COMMAND

2-15. *Command* is the authority that a commander in the armed forces lawfully exercises over subordinates by virtue of rank or assignment (JP 1, Vol 2). Command includes the authority and responsibility for effectively using available resources and for planning the employment of, organizing, directing, coordinating, and controlling military forces for the accomplishment of assigned missions. It also includes responsibility for health, welfare, morale, and discipline of assigned personnel.

2-16. As an art, command requires the use of judgment. Commanders constantly use their judgment for such things as delegating authority, making decisions, determining the appropriate degree of control, and allocating resources. Although certain facts like troop-to-task ratios may influence commanders, they do not account for the human aspects of command. The experience and training of commanders influence their decision making, proficiency in command stems from years of schooling, self-development, training, and operational experiences.

2-17. Command is a human skill sharpened by experience, study, and observation. Commanding at any level is more than simply leading Soldiers and units and making decisions. Commanders use their authority with firmness and care. When employed in high-risk environments, much like mountainous and cold weather regions, commanders strive to understand all aspects of their operational environment. Effective commanders create a positive command climate that instills a sense of mutual trust throughout the command. They use their judgment to assess situations, draw feasible conclusions, and make decisions. Commanders guide operations without stifling individual initiative. (See ADP 6-0 for additional information.) The key elements of command are—

- Authority.
- Responsibility

- Decision making.
- Leadership.

CONTROL

2-18. *Control* is the regulation of forces and warfighting functions to accomplish the mission in accordance with the commander's intent (ADP 6-0). Commanders exercise control over assigned forces in their AO. Control permits commanders to adjust operations to account for changing circumstances and direct the changes necessary to address the new situation. Commanders impose enough control to mass the effect of combat power at the decisive point in time while allowing subordinates the maximum freedom of action to accomplish assigned tasks.

2-19. The science of control supports the art of command. In contrast to the art of command, the science of control is based on objectivity, facts, empirical methods, and analysis. Commanders use the science of control to overcome the physical and procedural constraints under which units operate. In all operations, units are bound by such factors as movement rates, fuel consumption, weapons effects, rules of engagement, and legal considerations. Commanders strive to understand aspects of operations they can analyze and measure, such as the physical capabilities and limitations of friendly and enemy organizations. Control requires a realistic appreciation for time and distance factors, including the time required to initiate certain actions which is especially true when units employ in high-risk environments.

2-20. Commanders use control to direct and coordinate the actions of subordinate forces. They communicate information and receive feedback from subordinates to achieve greater shared understanding of the situation. This allows commanders to update their visualization with respect to the current situation, the end state, or their operational approach, and adjust operations to reflect those changes. (See ADP 6-0 for additional information.) The elements of control are—

- Direction.
- Feedback.
- Information.
- Communication.

2-21. *Control measure*—a means of regulating forces or warfighting functions (ADP 6-0)—provide control without requiring detailed explanations. Control measures help commanders to direct actions by establishing responsibilities and limits that prevent subordinate unit actions from impeding one another. They foster coordination and cooperation between forces without unnecessarily restricting freedom of action. Good control measures foster freedom of action, decision making, and individual initiative.

2-22. The most important control measure is the boundary. Boundaries define the assigned area to a commander. Commanders have full freedom of action to conduct operations within the boundaries of their assigned area unless the order establishing the assigned area includes constraints.

2-23. Control measures can be permissive (which allows something to happen) or restrictive (which limits how something is done) to prevent units from impeding one another and to impose necessary coordination. Some control measures are graphic. A *graphic control measure* is a symbol used on maps and displays to regulate forces and warfighting functions (ADP 6-0). Tailored to the higher commander's intent, small-unit commanders assign subordinate unit missions and impose control measures necessary to synchronize and maintain control over the operation. (See FM 1-02.2 for illustrations of graphic control measures and rules for their use.)

2-24. Commanders use the minimum number of control measures necessary to control their forces. They also consider the mission, terrain, and amount of authority delegated to subordinates. Effectively employing control measures requires commanders to understand their purposes and ramifications, including the permissions or limitations imposed on subordinates' freedom of action and initiative. Each measure should have a specific purpose—for example, mass the effects of combat power, synchronize subordinate forces' operations, or minimize the possibility of fratricide. (See chapter 3 and chapter 4, respectively, for examples of offensive and defensive control measures.)

2-25. Successful operations depend on how well commanders and subordinate leaders control their units and understand their mission. Due to the distances between units, the commander's control is sometimes limited

to a well-thought-out plan and thorough preparation. Commanders should develop a clear vision of how the operation may unfold, anticipate the decisive points, and place themselves at critical locations that may include heights overlooking subordinate operations.

2-26. Movement of larger units (those above company level) in mountain terrain is difficult to control due to the restrictive terrain, the ability to change the axis of advance, and the ability to have mutually supporting axes. If the company is moving as part of a larger force, higher commanders should allow for realistic time estimates for movement when executing missions based on timetables. Thorough reconnaissance and surveillance (R&S) and experience help commanders and subordinate leaders determine the time needed and the controlling measures required to control movement.

THE EXERCISE OF COMMAND AND CONTROL

2-27. The exercise of C2 by commanders conducting operations in mountainous environments is greatly affected by the terrain itself. For example, widely dispersed AOs and physically demanding topography, challenge C2 as well as communications systems. Commanders direct the actions of their subordinates within their commander's intent and concept of operations. While directing, commanders communicate information, in mission orders that provide subordinate units their tasks and instruct them how to cooperate within a broader concept of operations. In the process, the commander and subordinate leaders receive feedback from subordinates and supporting forces that allows them to update their visualization and to modify their individual plans. This feedback creates a reciprocal flow of information that leads to a shared understanding among all participants and units, especially those employed in high-risk environments.

RECIPROCAL FLOW OF INFORMATION

2-28. C2 is not a one-way, top-down process. In application, C2 is multidirectional, with feedback from lower echelons, from higher echelons, laterally, and from sources outside the chain of command. It includes the reciprocal flow of information—a multiplying element of combat power—between higher commanders and staffs and subordinates and other organizations in an AO as they work to achieve shared understanding and adjust to continuously changing circumstances in an operational environment.

2-29. As an example, the type, amount, and timeliness of RM information (inherent within high-risk environments) passed from higher to lower levels of command may have a significant effect on the level of detail used by lower unit leaders. The time between receiving the mission and initiating the warning order can significantly affect the time available for a subordinate unit to conduct risk assessments and implement appropriate controls to mitigate risks. While battalion- and higher-level headquarters have specialized staff sections conducting risk assessments, companies and platoons may have only one individual (specifically the company commander and platoon leader) performing assessments.

RISK ACCEPTANCE

2-30. Success during operations depends on a willingness to embrace risk as opportunity rather than treating it as something to avoid. In general terms, risk is the exposure of someone, or something valued to danger, harm, or loss. By its very nature, military activity involves understanding, balancing, and accepting risk. Risk is an expression of the probability and implications of an activity or event, with positive or negative consequences taking place. It is a measure of the likelihood of something going right or wrong, and the associated impact, good or bad. Because risk is part of every operation, it cannot be avoided. The acceptance of risk presents opportunities as well as the potential for grave consequences.

2-31. The complex and ever-changing nature of an operational environment means there is uncertainty in every operation. Because uncertainty exists in all operations, every decision involves risk. The willingness to accept risk is often key to exposing enemy weaknesses that an enemy force considers beyond friendly reach. The greatest opportunity may come from the course of action (COA) with the most risk. When considering how much risk to accept with a COA, commanders consider risk to the force and risk to the mission. Commanders need to balance the tension between protecting the force and accepting risks that must be taken to accomplish their mission. They apply judgment regarding the importance of an objective, time available, and anticipated cost.

2-32. Commanders focus on creating opportunities rather than simply preventing defeat—even when preventing defeat appears safer. Reasonably estimating and intentionally accepting risk is not gambling.

Gambling is staking the success of an entire action on a single event without considering the hazard to the force should the event not unfold as envisioned. Therefore, commanders avoid gambles. Commanders carefully determine risks, analyze and minimize as many hazards as possible, and then accept risks to exploit opportunities. Commanders analyze risk in collaboration with subordinates to help determine what level of risk exists and how to mitigate it. While each situation is different, commanders avoid undue caution or commitment of resources to guard against every perceived threat.

2-33. An unrealistic expectation of avoiding all risk is detrimental to mission accomplishment. Waiting for perfect intelligence and synchronization is likely to increase risk. Experienced commanders balance audacity and imagination with risk and uncertainty to strike in a manner unexpected by an enemy force.

RISK MANAGEMENT

2-34. *Risk management* is the process to identify, assess, and mitigate risks and make decisions that balance risk cost with mission benefits (JP 3-0). RM helps commanders and subordinate leaders make informed decisions to reduce or offset risk. When employed in high-risk environments, much like mountainous and cold weather regions, using this process increases a force's operational effectiveness and the probability of mission accomplishment. This systematic approach identifies hazards, assesses them, and manages associated risks. RM outlines a disciplined approach to express a risk level in terms readily understood at all echelons.

2-35. RM is a cyclical and continuous five-step process to identify and assess hazards; develop, choose, implement, and supervise controls; and evaluate outcomes as conditions change. Except in time constrained situations, planners complete the process in a deliberate manner—systematically applying all the steps and recording the results. In time-constrained conditions, the commander, staff, subordinate leaders, and Soldiers use judgment to apply RM principles and steps. (See ATP 3-21.10 for a detailed discussion on RM.) The five steps of RM are—

- Step 1—Identify the hazards.
- Step 2—Assess the hazards.
- Step 3—Develop controls and make risk decisions.
- Step 4—Implement controls.
- Step 5—Supervise and evaluate.

2-36. The operations process (see paragraph 2-62 to 2-64) frames understanding of how RM is integrated with the more complex decision-making processes, like those inherent in mountain and cold weather regions. Steps 1 and 2 of RM normally have greatest emphasis in the planning activity. Step 3 normally begins in planning and continues throughout the preparing activity. The majority of step 4 normally occurs within the preparing and executing activities, with some continuing emphasis in planning. Step 5 normally occurs during executing with some continuing emphasis in planning. The assessment activity of the operations process is continuous. The commander may adjust the level of body armor protection (for example, personal protective equipment posture [PPEP]) during dismounted movement in mountainous terrain balancing an increased risk level to individual Soldiers to improve the likelihood of mission accomplishment. (See ATP 3-21.18 for information on Soldier load.)

COMMAND POST ORGANIZATION AND OPERATIONS

2-37. The company CP does not have a set organization. It includes the commanding officer, other personnel and equipment required to support company C2. The CP is located where the commander determines it is best able to support C2. Its purpose is to provide communications with higher, lower, adjacent, and supporting units to assist the commander in planning, coordinating, and issuing company orders, and to support continuous operations by the company. Often the CP is required to provide its own security but can locate with subordinate elements on the move or remain stationary when necessary. (See ATP 3-21.10 for more information on company CP operations and organizations.)

COMPANY COMMAND POST

2-38. Normally, the CP includes the radiotelephone operators, fire support team headquarters, and the senior radiotelephone operator. The executive officer (XO), first sergeant (1SG), signal support noncommissioned officer (NCO), armorer, reserve element leader, and the leaders of attached or supporting elements may also

locate with the CP. When positioning the CP, the commander considers communication requirements, the security needs for the CP, and above all, the location where the commander is best able to fight the company. CP personnel support the commander by—

- Establishing C2 systems (antennas, radios, or tracking mechanisms).
- Assisting in preparation of the company operation order.
- Providing recommendations or input during planning.
- Receiving and sending required reports and updated information to the battalion and subordinates.
- The commander organizes and mans the CP to conduct continuous operations. Techniques the commander considers ensuring continuous operations include the following:
  - Cross-training personnel within the CP.
  - Ensuring the XO and 1SG are aware of critical decisions in the commander's absence.
  - Establishing a rest plan and ensure compliance.
  - Ensuring key decision makers get rest.

PRIMARY AND ALTERNATE COMMAND POST LOCATIONS

2-39. The commander establishes a CP to exercise C2 during all operations. When the mission requires it, the commander may establish a second CP to assist C2. The commander organizes a primary CP to control the battle, and an alternate CP that can assume command of the company if the primary CP is destroyed or unable to communicate. The commander considers security and communications requirements when positioning the primary and alternate CP, both on the move and stationary.

2-40. When moving, the commander designates where the CPs positions in the formation. At times the commander may move away from the CP, for example to better control the company's maneuver, in this instance the commander may move with the lead platoon or during the attack locate with the main effort. In these situations, the commander may designate a part of the CP (radiotelephone operators or the fire support officer) to move with the commander.

2-41. In static positions (assembly areas, battle positions), a stationary CPs location may be designated by the commander where field expedient antennas are employed to allow communications to be established with battalion, and subordinate units within the company. The stationary CP provides a designated location whereby messengers and leaders can report to conduct face-to-face interaction. The CP should be in defilade with covered and concealed routes to and from its location. The CP should be off-of natural lines of drift and key terrain features. It must be well-camouflaged from ground and air observation. Local security is provided by either its relation to rifle platoons, by collocating with the company reserve element, or using its own organic headquarters personnel. When the commander leaves the primary CP, the XO or the 1SG assume control of CP operations or when an alternate CP is established assumes control of CP operations from that location.

RESOURCING THE COMMAND POST

2-42. The most critical decision in organizing a company CP is committing resources. There are several options for manning a company CP when 24-hour CP operations are required. The basic manning requirement is for two NCOs to serve as NCOs in charge. One NCO is in charge during the day shift and the other is in charge during the night shift. These NCOs must be able to perform their duties with little or no supervision. There are several members of the company who can meet this manning requirement. They include but are not limited to—

- The signal support NCO.
- The fire support NCO (if available).

2-43. When conducting continuous 24-hour operations other members of the headquarters section can man needed positions in the CP, such as senior radiotelephone operators. At a minimum, there should be two senior radiotelephone operators. One senior radiotelephone operator supports the day shift and the other supports the night shift. The senior radiotelephone operator assists the NCO in charge as needed to accomplish the CP mission.

2-44. The Soldiers manning the company CP assist the commander by reducing the number of items the commander must personally track and report. This frees the commander to focus on and conduct troop leading procedures (TLP) during planning. Attached or operational control units can use the CP as the point of

contact. The units can further assist the commander in their TLP by supervising and enforcing the timeline and reproducing overlays and constructing sand tables for company and platoon rehearsals. The company CP is an information management center during the plan and preparation phase of a mission and battle tracking during mission execution.

INTELLIGENCE SUPPORT

2-45. Commanders require intelligence about the threat and other aspects of the operational environment before and during operations to accomplish their missions. Intelligence assists commanders in visualizing the operational environment, organizing their forces, and controlling operations to achieve their objectives by answering specific requirements focused in time and space. Intelligence products enable commanders to make decisions based on all available information, identify and assess potential COAs, plan operations, properly direct their forces, and enable targeting; and employ ethical, effective, and efficient tactics and techniques. Additionally, intelligence supports protection by alerting commanders to threats and assisting in preserving and protecting the force through the mitigation of risk.

ENVIRONMENTAL IMPACTS

2-46. Significant environmental impacts must be considered and mitigated to ensure the CPs remains functional despite cold temperatures, high winds, and the effects of altitude. When operating in an environment under harsh mountain and cold weather conditions, displacing the CP takes more time because of the environment and the terrain itself. Future CP locations or movement routes must be identified and reconnoitered (at least by map) to ensure the CP can function as intended.

COMMUNICATIONS

2-47. The ability to communicate during operations is essential. The company establishes radio nets to link the commander with higher headquarters and subordinate leaders. During operations, subordinate elements may have their own control net with the commander, primary CP, or alternate CP. Other communications techniques such as signals are established and rehearsed. Units must be prepared to operate with digital networks and during degraded communications periods. Messengers and visual signals are excellent means of communication during movement or when in static positions. The company may move under radio silence, or may use radios only in emergencies, or when it can use no other means of communication. (See FM 6-02 for additional information.)

Terrain and Weather Considerations

2-48. Terrain and unpredictable weather conditions affect communications at high altitudes. While unobstructed line of sight (LOS) radio communication conditions are excellent in the mountains, they are often difficult to achieve due to mountain ridges, intervening crests, and peaks. These terrain obstructions frequently interfere with LOS, very high frequency (VHF) radio communications such as the single-channel ground and airborne radio system (also called SINCGARS). Units can be in the bottom of a depression 1,000 meters (3,280 feet) away from another unit and not be able to communicate. At other times, they may be on a mountaintop and able to communicate throughout the AO. Mountain terrain not only interferes with ground-to-ground communications but can interfere with air-to-ground and air-to-air communications as well.

2-49. In addition to LOS issues, extreme operating distances further complicate frequency modulation communications in mountain environments. Terrain and distance combined often complicate frequency modulation communications to the point that they become ineffective or unreliable.

2-50. Commanders should understand the limitations that mountains and cold weather climates place on communications systems. They should adapt to these conditions and find avenues around these limitations, allowing units to communicate. Various possibilities for establishing communications should be considered to aid in communication efforts. Some communications techniques and systems that have been used in mountain environments to assist in LOS and other communications issues include—

- Moving to regain LOS with the receiver.
- Relaying transmissions from station to station.

2-51. Employing retransmissions (RETRANS) stations include—

- Using commercial radios.
- Using cell phones.
- Using couriers.

2-52. Communications planning in mountain terrain should include—

- Identifying problems ahead of time through a map reconnaissance and information gained through collection efforts.
- Coordinating with adjacent units and aircraft.
- Using RETRANS stations.
- Obtaining additional batteries due to the increase in battery usage.
- Employing a primary, alternate, contingency, and emergency communications plan.
- Establishing backup communications systems.
- Ensuring dissemination.

Communications Equipment

2-53. When using VHF radios in the mountains, automatic frequency hopping, encryption, and burst transmission capabilities work best. Battery power can decline quickly in extreme cold temperatures. Lithium batteries typically have more power and last longer than standard alkaline batteries and should be considered for routine issue. (See ATP 3-90.97 for additional cold weather impacts on communications.)

2-54. RETRANS stations can be used to assist in VHF communications. These stations allow using units with LOS to the RETRANS site, but not to each other, the ability to communicate with VHF radios. Common LOS radios include the:

- AN/PRC-119 single-channel ground and airborne radio system.
- AN/PRC-119 advance special improvement program models.
- AN/PRC-148 Multiband Inter/Intra Team Radio (also called MBITR).

2-55. In mountain environments, satellite communications and the use of C2 aircraft or unmanned RETRANS aircraft can offset some terrain limitations and reduce reliance on bulky less effective radio equipment. To assist in communications efforts, beyond LOS radios are often employed. Units may also consider high frequency communications systems that are not LOS dependent. Radios such as the AN/PRC-150 that operate in the high frequency band as well as tactical satellite radios that operate in the ultra-high frequency band have frequently been used in mountain operations. These radios can communicate over vast distances and do not require LOS between using units. The tactical satellite system is relatively easy to operate but it requires operators speak in deliberate conversation. Tactical satellite communications can be conducted using the:

- AN/PRC 117F.
- AN/PSC-5C/D.
- Multiband inter/intra team radio as a satellite communication system.
- Satellite phone.

Retransmission Stations

2-56. RETRANS stations can greatly assist in gaining better coverage for radio communications systems. These stations are often situated on the highest available peaks in order to provide optimal range and coverage (see figure 2-1 on page 22). The use of VHF radio communications often requires the augmentation of carefully selected RETRANS sites. These sites are located on (or cause the area to inevitably become) key terrain. Mountain peaks often become part of the communications infrastructure and are crowded with military, national, commercial radio, television, and telephone communications systems, sites, and relay towers. These areas also often tend to be best for establishing RETRANS stations.

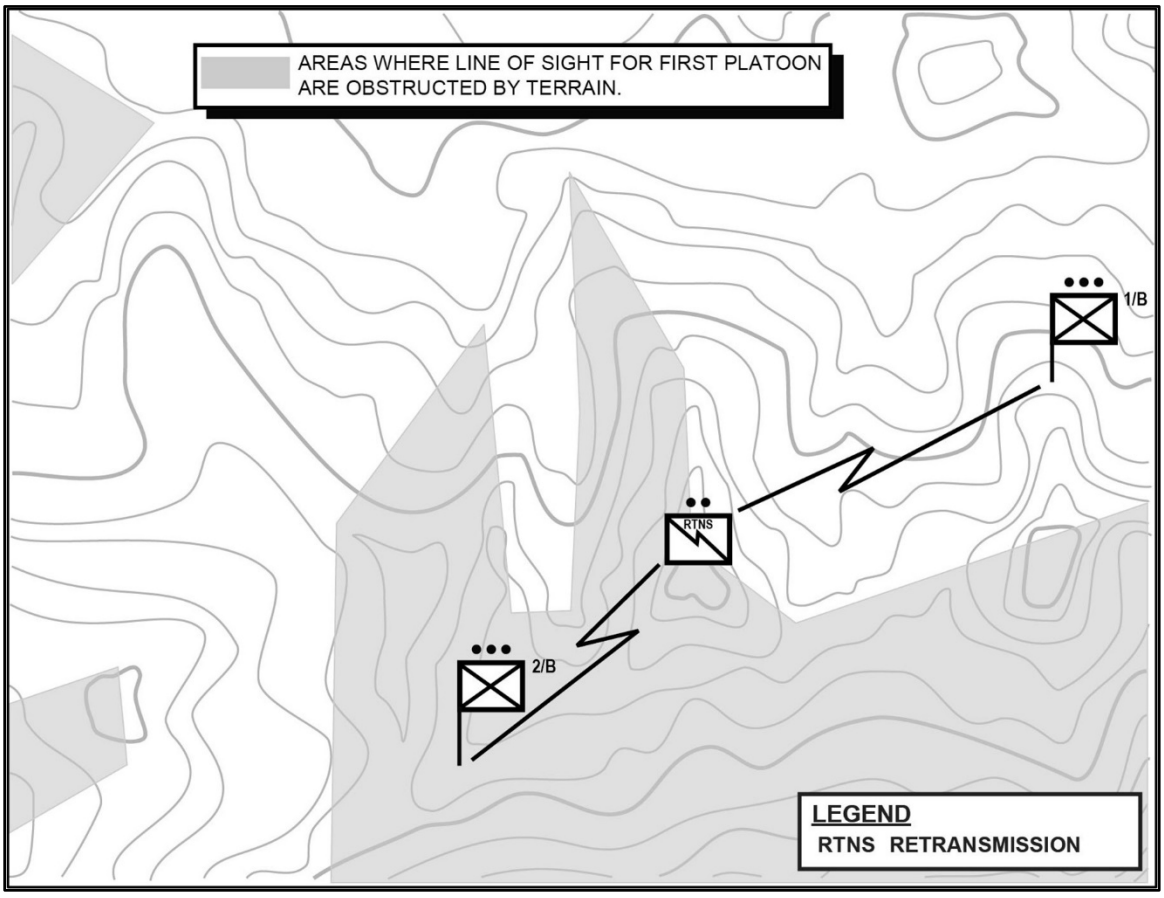


Figure 2-1. Retransmission station

2-57. Due to the terrain and weather conditions at altitudes, crews responsible for installing and maintaining RETRANS stations should be well-trained in mountain survival techniques. RETRANS teams may also require specialized mountain mobility training and equipment to reach higher terrain. Isolated RETRANS stations are prone to being targeted by the enemy and protection of these areas is a difficult, but required, operation. During employment of RETRANS stations, commanders should consider—

- Availability of personnel required to man the station.
- Availability of additional equipment.
- Security and sustainment of the station.
- Additional missions to include doubling as an observation post (OP).

Note. The battalion staff, specifically the signal staff officer in coordination with the intelligence staff officer, operations staff officer, and electromagnetic warfare (EW) NCO, assesses threats to friendly communications during the communications planning process. Planning counters the enemy's attempts to take advantage of the vulnerabilities of friendly communications systems. Ultimately, the commander, subordinate commanders, staff planners, and radio and network operators are responsible for the security and continued operation of all C2 systems. The primary, alternate, contingency, and emergency (also called PACE) plan is a communications plan that exists for a specific mission or task, not a specific unit, as the plan considers both intra- and inter-unit sharing of information. Upon receipt of the battalion order, the company signal support NCO, in coordination with the commander, evaluates the primary, alternate, contingency, and emergency plan for two key elements as follows: does the company have the assets to execute the plan and how can the company nest with the plan when the company develops its own plan? (See ATP 3-21.20 for additional information on communications planning.)

ELECTROMAGNETIC WARFARE

2-58. *Electromagnetic warfare* is military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy (JP 3-85). Commanders at each echelon integrate EW activities into operations through cyberspace electromagnetic activities. EW capabilities are applied from the air, land, sea, space, and cyberspace by manned, unmanned, attended, or unattended systems. Cyberspace electromagnetic activities are the process of planning, integrating, and synchronizing cyberspace and EW operations in support of unified land operations. *Cyberspace operations* is the employment of cyberspace capabilities where the primary purpose is to achieve objectives in or through cyberspace (JP 3-0).

2-59. EW capabilities assist the commander in shaping the operational environment to gain an advantage. For example, EW may be used to set favorable conditions for cyberspace operations by stimulating networked sensors, denying wireless networks, or other related actions. Operations in cyberspace and the electromagnetic spectrum depend on EW activities maintaining freedom of action in both. EW consists of three functions, electromagnetic attack, electromagnetic protection (EP), and electromagnetic support. In any environment, the primary focus at the company level is on EP considerations as it relates to communications within small-unit operations.

2-60. EP involves the actions taken to protect personnel, facilities, and equipment from any effects of friendly or enemy use of the electromagnetic spectrum that degrade, neutralize, or destroy friendly combat capability. For example, EP includes actions taken by the commander to ensure friendly use of the electromagnetic spectrum, such as frequency agility in a radio or variable pulse repetition frequency in radar. The commander avoids confusing EP with self-protection. Both defensive electromagnetic attack and EP protect personnel, facilities, capabilities, and equipment. However, EP protects from the effects of electromagnetic attack (friendly and enemy) and electromagnetic interference, while defensive electromagnetic attack primarily protects against lethal attacks by denying enemy use of the electromagnetic spectrum to guide or trigger weapons. (See ATP 3-21.20 for additional information on EW functions and activities.)

SECTION IV – ORGANIZING AND PUTTING COMMAND AND CONTROL INTO ACTION

2-61. The Army's framework for organizing and putting C2 into action is the operations process. Like any other environment, commanders in mountain environments employ the operations process to drive the conceptual and detailed planning necessary to understand, visualize, and describe their operational environment; make and articulate decisions; and direct, lead, and assess military operations. While the exercise of C2 itself does not change in the mountains, the application of C2 can be significantly affected by the physical environment during centralized planning and decentralized execution.

OPERATIONS PROCESS

2-62. The operations process consists of the major C2 activities performed during operations (planning, preparing, executing, and continuously assessing). Commanders, supported by their staffs, employ the operations process to drive the conceptual (specifically the Army's design methodology [see FM 3-96]) and detailed (specifically the military decision-making process [see ATP 3-21.20] and TLPs [see ATP 3-21.10]) planning necessary to understand, visualize, and describe their operational environment; make and articulate decisions; and direct, lead, and assess military operations. During preparation and execution, commanders at each echelon access and direct the actions of subordinates and adjust operations based on changes to the situation and feedback from subordinate units and attachments and external organizations.

2-63. While the military decision-making process seeks an optimal solution, the rapid decision making and synchronization process (RDSP) seeks a timely and effective solution within the commander's intent. Using the RDSP lets leaders avoid the time-consuming requirements of developing decision criteria and multiple COAs. Under the RDSP leaders combine their experiences and intuition to understand the situation quickly and develop a COA. The RDSP is based on an existing order and the commander's priorities as expressed in the order. (See ATP 3-21.20 for details on conducting the RDSP within the battalion.)

2-64. During the operations process, the company commander maintains control of subordinate units largely through mission orders. The company receives warning orders, operation orders, and fragmentary orders

from the battalion and subsequently uses TLP to generate the company's own order to subordinate platoons, and other elements, within or attached to the company. The procedural steps for company-level TLP covered during the planning phase of the operations process are the same for mountain operations as with any other environment. Unique to mountain operations are those factors within TLP that pertain specifically to the terrain and weather analysis. In some situations, time constraints or other factors may prevent the company commander from performing each step of TLPs as thoroughly as possible. For example, during the step, make a tentative plan; the commander often develops only one acceptable COA vice multiple COAs. (See ATP 3-21.10 for details on conducting the operations process within the company.)

INTELLIGENCE PREPARATION OF THE OPERATIONAL ENVIRONMENT

2-65. Intelligence preparation of the operational environment (IPOE) is the systematic process of analyzing the mission variables of enemy, terrain, weather, civil considerations, and informational considerations in each of the factors in an area of interest to determine their effect on operations. The IPOE process consists of the following four steps: define the operational environment; describe environmental effects on operations; evaluate the threat; and determine threat COAs. Led by the battalion intelligence staff officer, the entire staff participates in the IPOE to develop and sustain an understanding of the enemy, terrain and weather, and civil considerations. IPOE helps identify options available to friendly and threat forces. (See ATP 3-21.20 for additional information.)

2-66. The IPOE process supports all activities of the operations process and identifies gaps in current intelligence. IPOE products help the commander and staff, and subordinate commanders and leaders understand the threat, physical environment, and civil considerations throughout the operations process. (See ATP 2-01.3 for more information.)

Note. The battalion intelligence staff officer contacts the U.S. Air Force staff weather officer assigned to the Infantry brigade combat team (IBCT) headquarters to obtain accurate, timely, and relevant predictive weather effects assessments, information and products tailored to the unit's specific needs in support of the IPOE process. If no staff weather officer is available at the IBCT headquarters, contact the next echelon.

2-67. The intelligence IPOE products available to an Infantry rifle company come from higher echelon staffs (specifically intelligence staff sections), from or through the Infantry battalion. When those staffs have sufficient time to develop IPOE products, they may contain sufficient detail to help in planning company and below, small-unit operations. All though not inclusive, these products include the modified combined obstacle overlay (MCOO); a battalion-level terrain analysis product that should contain information on mobility corridors down to platoon size. The overlay may also include analysis of infiltration or exfiltration routes within the company AO. The IPOE itself generally includes a study of enemy and civilian dispositions; and an analysis of the terrain to aid in the development of conclusions concerning enemy capabilities, vulnerabilities, and intentions. While these products are helpful, a detailed map and leader's reconnaissance (see ATP 3-21.10) by the commander and subordinate leaders, remain essential to the conduct of offensive and defensive small-unit operations.

2-68. In analyzing the enemy, the company commander must understand the IPOE. Although the company commander does prepare IPOE products for use in preparation of analysis, and orders, the commander does not prepare individual products for subordinates. The commander must be able to use the products of the battalion's IPOE effectively, in the analysis and be able to inform subordinates based on the compilation of company and higher echelon IPOE products. Battalion IPOE products necessary to support company planning and operations include—

- Threat situation templates (also called SITTEMPs) and COA statements and high-value target lists.
- Terrain and weather products.
- Tactical decision aids (such as MCOOs and terrain effects evaluations, weather forecast charts, weather effects matrices, and light and illumination data tables).
- Civil considerations tools and products.

2-69. The company commander's mission analysis helps decide how to conduct effective combat operations in a particular AO. When planning small-unit operations, commanders and subordinate leaders' analysis includes ensuring the company is operating in a way that capitalizes on the unique characteristics of mountain environments and uses those characteristics to the company's advantage. (See ATP 3-21.10 for additional information.)

ANALYSIS OF TERRAIN AND WEATHER

2-70. Terrain and weather, unique to mountainous and cold weather regions, are key aspects to the company commander's mission analysis. When analyzing terrain, the commander considers man-made features and effects on natural terrain features and climate. The commander also considers the effects of man-made and natural terrain in conjunction with the weather on friendly and enemy operations. In general, terrain and weather do not favor one side over the other unless one is better prepared to operate in the environment or is more familiar with it. The terrain may favor defending or attacking; however, in the case of mountainous terrain, it usually favors defensive operations. Analysis of terrain answers the question: What is the terrain's effect on the operation? The commander analyzes terrain using the military aspects of terrain (see paragraph 2-71). The commander determines how the weather affects the visibility, mobility, and survivability of the company and that of the enemy using the military aspects of weather (see paragraph 2-85). (See ATP 3-21.10 for additional information common to all environments.)

Note. From the MCOO developed by battalion, the company commander already has an understanding the general nature of the ground and effects of weather. However, the commander must conduct a detailed analysis to determine how terrain and weather uniquely affects the company's mission and the enemy. The commander must go beyond merely passing along the MCOO to subordinate leaders and making general observations of the terrain such as, this is high ground, or this is a stream. The commander must determine how the terrain and weather affect the enemy and company. Additionally, the commander applies these conclusions when developing a COAs for both enemy forces and the company. At company level and below, the commander and subordinate leaders develop a graphic terrain analysis overlay. This product is similar to the MCOO in it shows the critical military aspects of terrain. Not only does it facilitate planning, but it also aids in briefing subordinates. (See Maneuver Center of Excellence echelon-specific Infantry Army technique publications for additional information.)

MILITARY ASPECTS OF TERRAIN

2-71. The commander analyzes terrain using the military aspects of terrain: obstacles, avenues of approach, key terrain, observation and fields of fire, and cover and concealment (also called OAKOC). See ATP 2-01.3 and ATP 3-34.80 for information on analyzing the military aspects of terrain. Military aspects of terrain are used to analyze the ground. The sequence can vary. The leader determines the effects of each aspect of terrain on both friendly and enemy forces. These effects translate directly into conclusions applying to friendly or enemy COAs. Even if time is tight, the commander should allocate as much time as possible to factor, starting at the objective area, and analyzing other aspects of key terrain. (See ATP 3-21.10, appendix B for more details on each aspect.) Conclusions include at least the following:

- Template of enemy forces and essential weapon systems.
- Positioning of own assets.
- Understanding of time and space relationships of events, leading to thorough contingency plans.
- Echeloning and identifying of enemy observation and indirect fires.
- Selecting of movement techniques and formations, to include identifying actions on contact and when to transition to tactical maneuver.

2-72. Terrain considerations, unique to the company's AO, must be accounted for when planning and preparing for mountain operations. Terrain considerations to examine regarding this unique environment include the following military aspects of terrain.

Obstacles

2-73. Natural mountain obstacles include deep defiles, cliffs, rivers, landslides, avalanches, crevices, and scree slopes, as well as the mountains themselves. Obstacles vary in their effect on different forces. Commanders should evaluate the terrain from both the enemy and friendly force perspective. They should look specifically at the degree to which obstacles restrict operations, and at the ability of each force to exploit the tactical opportunities that exist when obstacles are employed. Man-made obstacles used in conjunction with restrictive terrain are extremely effective in the mountains, but their construction is very costly in terms of time, materiel, transportation assets, and labor. Commanders should know the location, extent, and strength of obstacles so that they can be incorporated into their scheme of maneuver.

2-74. Mounted movement is severely restricted in the mountains. Mountain vehicle traffic is limited to the road and trail networks as movement across unimproved mountain terrain is next to impossible. Most mountain road and trail networks are narrow and constitute movement in nearly single file convoys. Terrain restricted movements allow the enemy to predict movement corridors and effectively choose areas of engagement. Leaders must accept risk and plan accordingly when conducting movement along limited mobility corridors.

2-75. Harsh roads and weather conditions as well as enemy activity can disable a vehicle, creating an instant obstacle on a narrow path. Units should have plans to remove a disabled vehicle to clear the road or trail. Tow straps, tow bars, winches, sandbags, spill kits, shovels, and recovery capabilities for damaged vehicles should accompany all moving units if possible.

2-76. Dismounted movements can be slow and exhausting in mountain terrain. Traveling over steep, uneven, rugged terrain can quickly drain a Soldier's strength if proper precautions are not taken. (See chapter 5 for a detailed discussion of movement in the mountains.)

2-77. The compartmentalization of mountain terrain dictates the nature of mountain combat. Compartments are not necessarily large and units operating in these areas may become easily separated for periods. Compartmentalization effects on operations may include—

- Degraded ability to switch to an alternate axis of advance quickly.
- Difficulty in maintaining mutual support between units.
- Difficulty in moving reserve assets across the terrain.
- Increased difficulty in coordinating the battle in multiple mobility corridors.
- Difficulty in maintaining LOS communications.
- Increased demands on junior leaders due to separation from higher-level units.

Avenues of Approach

2-78. In mountain terrain, there are few easily accessible avenues of approach. Those that exist usually run along valleys, defiles, or on crests and spurs of ridges. This type of geography allows a defender to economize in difficult terrain and concentrate mainly on dangerous avenues of approach. A typical offensive tactic is to conduct a coordinated assault with the main effort along accessible avenues of approach and supporting efforts by one or more maneuver elements on difficult and unexpected avenues of approach. Normally, high rates of advance and heavy concentration of forces are difficult or impossible to achieve along mountain avenues of approach. Relief features may create large areas of dead space that facilitate covert movement. Units may seek to use difficult and unlikely avenues of approach to achieve surprise. These can be extremely high-risk operations and are prone to failure unless forces are well-trained and experienced in mountaineering techniques. In mountain terrain, the analysis of avenues of approach should be based on a thorough reconnaissance and evaluated in terms of the following factors:

- Ability to achieve surprise.
- Vulnerability to attack from surrounding heights.
- Ability to provide mutual support to forces on other avenues of approach.
- Effect on rates of advance.
- Effect on C2.
- Potential to accommodate deception operations.

- Ability to support necessary sustainment operations.
- Access to secure rest and halt sites.
- Potential to fix the enemy and reduce the possibility of retreat.

Key Terrain

2-79. *Key terrain*—an identifiable characteristic whose seizure or retention affords a marked advantage to either combatant (ADP 3-90)—may be found at any of the three operational terrain levels (see figure 1-2 on page 7). The commander must clearly understand the effects operational terrain levels I, II, and III (as described in chapter 1) have on operations and how each level influences the other. The commander identifies and controls dominant terrain at each operational terrain level to facilitate maneuver of the company. The commander and subordinate leader visualize, describe, and direct operations vertically as well as horizontally in mountainous terrain. Key terrain generally increases in importance with an increase in elevation and a decrease in accessibility.

2-80. In the mountains, terrain that is higher than that held by the opposing force is often key, but only if the force is capable of fighting there. A well-prepared force capable of maneuver in rugged terrain can gain an even greater advantage over an ill-prepared enemy at higher elevation levels. Most operations in the mountains require that the commander designate decisive terrain in the concept of operations and to communicate its importance to subordinate leaders. In operations over mountain terrain, the analysis of key and decisive terrain is based on the identification of these features at each of the three operational terrain levels. There are few truly impassable areas in the mountains. The commander should also recognize that what may be key terrain to one force might be an obstacle to another. The commander must recognize that properly trained combatants can use high obstructing terrain to achieve decisive victories with comparatively small-sized combat elements.

2-81. Controlling areas of lower elevations often means occupying those areas of key terrain above it such as mountain ridges. Keeping this in mind, crew-served weapons will often be placed on high ridges and peaks where vehicle access is extremely limited. Surveillance assets such as the Improved Target Acquisition System and Long-Range Advanced Scout Surveillance System, placed with crew-served weapons on high terrain can help control key passes and ridgelines. Pack animals may be used to carry these weapons to higher elevations. (See chapter 6 for more on the use of pack animals.)

Observation and Fields of Fire

2-82. Although mountain terrain generally permits excellent long-range observation and fields of fire, steep slopes and rugged terrain affect a Soldier's ability to estimate range accurately and frequently cause large areas to be hidden from observation. The existence of sharp relief and dead space facilitates covert approaches, making surveillance difficult despite long-range observation. Factors that influence an individual's ability to observe and engage targets in mountain terrain are—

- Naturally occurring dead space from hills, gullies, and ravines.
- Naturally occurring weather conditions such as rain, fog, and snow.
- The ability to observe and identify targets in conditions of bright sunlight.
- The ability to estimate range in clear air.
- The ability to apply wind corrections.
- The ability to shoot accurately up and down vertical slopes.

Cover and Concealment

2-83. The combination of trees, jagged rocks, and the folds of the earth offer excellent cover and concealment for friendly and enemy units alike. Small streambeds offer routes for ingress and egress as well as provide an environment for enemy activities including observation, communications relay, logistics, indirect fire, attacks, or ambushes.

2-84. The identification and proper use of the cover and concealment provided by mountain terrain is fundamental to all aspects of mountain operations. Ridge systems may provide covert approaches through many areas that are hidden from observation by the vegetation and relief. The difficulties a force encounters in finding available cover and concealment along ridges are fewer than those on the peaks, especially above

the timberline. Uncovered portions of an approach leave a force exposed to observation and fire for long periods. The enemy can easily detect movement in these areas, leaving the commander with three primary options to improve cover and concealment:

- Identify and exploit avenues of approach the enemy would consider unlikely, due to their difficult ascent or descent.
- Negotiate routes during periods of limited visibility.
- Provide overwhelming route security.

MILITARY ASPECTS OF WEATHER

2-85. The military aspects of weather are visibility, winds, precipitation, cloud cover, temperature, humidity, and atmospheric pressure (see ATP 3-21.10, appendix B for more details on each aspect). Consideration of the weather's effects is an essential part of the commander's mission analysis. The commander goes past observing to application. The commander determines how the weather affects the visibility, mobility, and survivability of the company and that of the enemy. The commander applies the results to the friendly and enemy COA during development. The subordinate leaders within the company review their commander's conclusions and identify their own.

2-86. Weather conditions in mountain environments may create unprecedented advantages and disadvantages for combatants. To fight effectively, commanders should acquire accurate weather information about their AO and know changing weather conditions and common indicators of upcoming inclement weather.

2-87. Terrain has a dominant effect on local climate and weather patterns in the mountains. Mountain environments are subject to frequent and rapid changes of weather, including fog, strong winds, extreme heat or cold, and heavy rain or snow. Local mountains can create their own microclimates and therefore many forecasts that describe weather over large areas of terrain are inherently inaccurate for the mountains themselves. The assigned Air Force staff weather officer should be able to develop local, terrain-based forecasts by combining available forecasts with field observations (local temperature, wind, precipitation, cloud patterns, barometric pressure, and surrounding terrain). Incorporating field observations into forecasts improves accuracy and enhances the ability to exploit opportunities offered by the weather, while minimizing its adverse effects.

2-88. During inevitable bad climate conditions in mountain environments, common tasks or operations become increasingly difficult to accomplish. If bad weather is expected or experienced, units should consider weather-related operational issues such as the early resupply of needed items or the adjustment of operations to accommodate the potential lack of ground and aerial resupply. Added effects for mountain environments as well as other inherent climate issues are shown in table 2-1.

Table 2.1 Weather condition effects

Weather Condition	*Flat to Moderate Terrain Effects*	*Added Mountain Effects*
Sunshine	• Sunburn. • Snow blindness. • Temperature differences between sun and shade.	• Increased risk of sunburn and snow blindness. • Severe, unexpected temperature variations between sun and shade. • Avalanches.
Wind	• Windchill. • Blowing debris.	• Increased risk and severity of windchill. • Blowing debris or driven snow causing reduced visibility.
Rain	• Reduced visibility. • Cooler temperatures.	• Landslides. • Flash floods. • Avalanches.
Snow	• Cold weather injuries. • Reduced mobility and visibility. • Snow blindness. • Blowing snow.	• Increased risk and severity of common effects. • Avalanches.
Storms	• Rain/snow. • Reduced visibility. • Lightning.	• Extended duration and intensity greatly affecting visibility and mobility.
Fog	• Reduced mobility/visibility.	• Increased frequency and duration.
Cloudiness	• Reduced visibility.	• Greatly decreased visibility at higher elevations.

2-89. Company subordinate leaders and Soldiers should understand the need to be prepared for extreme climate changes while operating in the mountains. Environmental changes such as extreme cold, blizzards, fog, heavy rain downpours, flash floods, and lightning not only slow the pace of operations but also can completely shut them down. Personnel should be ready for extreme cold, hot, windy, wet, and stormy conditions. Units may experience heat and cold injuries in the same day. They should be prepared for characteristic problems such as frostbite and snow blindness.

2-90. Personnel safety concerns are extremely heightened in mountain climates. Extra precautions should be taken to prevent heat, cold, and accidental injuries. During movements, extreme weather conditions can cause personnel to lose sight of roads, trails, markers, and other personnel. Snow can mask dangerous holes, cracks, and crevices. Roads and trails traditionally open for vehicle or foot traffic during summer months may be closed during winter months. Spring rains can cause mountain creeks to swell and become extremely dangerous. (See ATP 3-90.97 for additional information on cold weather operations.)

2-91. Weather conditions can have a drastic effect on all types of movement including dismounted, mounted, and air movements. Chapter 5 discusses the effects of mountain environments on movements in detail.

CENTRALIZED PLANNING AND DECENTRALIZED EXECUTION

2-92. Mountain operations usually require centralized planning and decentralized execution of missions to accomplish the higher commander’s intent. Decentralized execution is essential to seizing, retaining, and exploiting the initiative during operations in environments where conditions rapidly change, and uncertainty is the norm. Rapidly changing situations and uncertainty are inherent in operations where commanders seek to establish a tempo and intensity that enemy forces cannot match. Decentralized execution requires disseminating information to the lowest possible level so subordinates can make informed decisions. This allows subordinates to cope with rapidly changing conditions by exercising initiative within their

commander's intent. Generally, the more dynamic the circumstances, the greater the need for initiative to make decisions at lower levels. Subordinates are always expected to exercise disciplined initiative to achieve their commander's intent. It is the commander's responsibility to ensure subordinates are prepared in terms of education, training, and experience to do so.

2-93. Different operations and phases of operations may require tighter or more relaxed control over subordinate elements than other phases. Even if a commander has decided to operate in a more centralized manner, subordinates are still expected to make decisions and take action consistent with their commander's intent. For example, during a forward passage of lines in compartmented mountainous terrain, the movement of the passing force may be tightly controlled to maintain tempo and prevent fratricide. Subordinates may not be delegated much decision-making authority and be required to execute in a centralized manner. However, once passing forces reach the release point and begin their movement or attack, they may operate in a more decentralized manner depending on the plan. Even in a highly controlled operation, subordinates must still exercise initiative to address unexpected problems or conditions and to achieve their commander's intent.

Chapter 3
Offense

In mountainous and cold weather regions, commanders seek to exploit an enemy's weakness by using unique mountain and cold weather characteristics (see chapter 1) to an offensive advantage. Offensive operations in mountainous regions are conducted for three primary purposes: to deny an enemy a base of operation to conduct operations against U.S. or coalition forces; to isolate and defeat enemy forces before they are capable of operations in populated areas; and to secure lines of communication for friendly and coalition forces. During planning, commanders understand that even a technologically inferior enemy can capitalize on the advantages of mountain terrain and potentially mitigate U.S. Forces' advantages in target acquisition, surveillance, and combat power. This chapter discusses offensive tactics, techniques, and procedures (TTP) and how the physical characteristics of mountains operations support and enhance offensive missions.

SECTION I – DOCTRINAL BASIS FOR THE OFFENSE

3-1. As in all operations, small-unit offensive techniques cannot be discussed in isolation. There must be a seamless continuity and understanding between the fundamental doctrinal principles, tactics, and procedures covered in Army field manuals, specifically FM 3-96, and the techniques covered in Army techniques publications, specifically ATP 3-21.10. This section briefly discusses offensive operations and the characteristics of the offense.

OFFENSIVE OPERATIONS

3-2. An *offensive operation* is an operation to defeat or destroy enemy forces and gain control of terrain, resources, and population centers (ADP 3-0). The four primary offensive operations are movement to contact (MTC), attack, exploitation, and pursuit. (See FM 3-96 and ATP 3-21.20 for a detailed discussion of each of the four offensive operations.) The most likely offensive operations assigned to an Infantry small unit (company or subordinate platoon) are an attack or MTC. (See ATP 3-21.10 and ATP 3-21.8 for the basic doctrine to conduct ground combat operations during an attack or MTC.) Section III addresses small-unit offensive techniques for MTC and attack specific to mountain and cold weather operations.

MOVEMENT TO CONTACT

3-3. *Movement to contact* is a type of offensive operation designed to establish or regain contact to develop the situation (FM 3-90). An MTC creates favorable conditions for subsequent tactical actions. The commander conducts an MTC when the enemy situation is vague or not specific enough to conduct an attack. An Infantry rifle company generally conducts an MTC as part of an Infantry battalion operation.

3-4. In the mountains where maneuver space is limited, an MTC may be conducted by an even smaller element, such as a platoon, if an engagement with the enemy is expected to be within its capabilities. Canalizing mountain terrain that limits maneuver may lead commanders toward conducting reconnaissance or security patrols as opposed to an MTC with the intent to gather information and develop the situation for a company or platoon hasty attack.

3-5. The company or subordinate platoon or squad may conduct tasks (for example, passage of lines, tactical road march, or approach march) prior to the start of an MTC or as a follow-on task. Cordon and search and search and attack (see ATP 3-21.10) are variations of MTC. When involved in operations in support of

stability operations tasks, unit offensive actions are normally closely related to these two variations of MTC: (See ATP 3-21.10 and ATP 3-21.8 for the basic doctrine to conduct ground combat operations.)

- *Cordon and search* is a variation of movement to contact where a friendly force isolates and searches a target area (FM 3-90).
- *Search and attack* is a variation of a movement to contact where a friendly force conducts coordinated attacks to defeat a distributed enemy force (FM 3-90).

ATTACK

3-6. An *attack* is a type of offensive operation that defeats enemy forces, seizes terrain, or secures terrain. (FM 3-90). Attacks take place along a continuum defined at one end by fragmentary orders that direct the execution of rapidly executed battle drills by forces immediately available. For example, the Infantry rifle company discovers the general enemy situation through an MTC and conducts an attack as a continuation of the meeting engagement to exploit a temporary advantage in relative combat power and to preempt enemy actions. The other end of the continuum includes published, detailed orders with multiple branches and sequels, detailed knowledge of all aspects of enemy dispositions, a force that has been task organized specifically for the operation, and the conduct of extensive rehearsals. Most attacks fall between the ends of the continuum as opposed to either extreme.

3-7. An attack at the company level is normally conducted as part of a larger force and is an offensive action characterized by close combat. When the commander decides to attack, the commander masses the effects of overwhelming combat power against a portion (or portions) of the enemy force with a tempo and intensity that the enemy cannot match. A force-oriented objective requires the attacker to focus its efforts on a designated enemy force. The enemy force may be stationary or moving. A terrain-oriented objective (at company- or platoon-level) requires the company or platoon to seize, secure, or retain a designated geographical area. All attacks depend on the synchronization and integration of combat power for success. They require planning, coordination, and time (although time may be limited) to prepare. During mountain operations, a company or subordinate element most often participates in a synchronized hasty or deliberate attack (as part of a battalion or larger operation) where the defeat of a specific force or control of some terrain is the main effort. Generally, company- or platoon-level attacks are more often in the form of either a raid or an ambush, where the retention of terrain is not an objective.

3-8. The four variations of the attack are ambush, counterattack, raid, and spoiling attack. As variations of the attack, they share many of the planning, preparation, and execution considerations of the attack. The commander's intent and the mission variables of METT-TC (I), which stands for mission, enemy, terrain and weather, troops and support available, time available, civil considerations, and informational considerations, determine which variation of the attack is employed. The commander can conduct each of these variations of the attack, except for a raid, as either a hasty or a deliberate operation. The most likely variation of the attack assigned to an Infantry small unit (company or subordinate platoon) is an ambush or raid. (See ATP 3-21.10 and ATP 3-21.8 for the basic doctrine to conduct ground combat operations during an attack or variation of an attack.) Section III addresses small-unit offensive operations for deliberate and hasty attacks, and the following ambush and raid specific to mountain and cold weather operations are:

- An *ambush* is a variation of attack from concealed positions against a moving or temporarily halted enemy (FM 3-90).
- A *raid* is a variation of attack to temporarily seize an objective with a planned withdrawal (FM 3-90).

CHARACTERISTICS OF THE OFFENSE

3-9. The characteristics of the offense—surprise, concentration, tempo, and audacity—are the same for any offensive operation. Commanders and subordinate leaders, though, must understand how mountainous terrain and cold weather environments affect these characteristics to effectively plan, prepare for, and execute offensive missions. Commanders and subordinate leaders who understand the impact of these environments on operations, as well as the impact on potential actions the enemy may take when attacked, are better able to use that knowledge to capitalize on developing the situation through anticipated contact and battle drills. (See FM 3-96 for a detailed discussion of each characteristic.)

SURPRISE

3-10. In the mountains, surprise is a major factor in achieving mission success in offensive operations. It is also more difficult to achieve than in many other environments. Units achieve surprise by striking the enemy at a time, place, or manner in which they are unprepared. While planning company, platoon, or squad movements, leaders should assume they will be observed by the enemy and plan for the necessary actions. These include the use of terrain, dispersion, movement along more than one route or at different times, and movement during limited visibility conditions. In their planning, commanders and leaders must account for slow and tedious movements in restricted mountain terrain. Movements through restrictive mountain terrain during periods of limited visibility can aid in the ability to achieve surprise. In addition, movement through an appropriate level of vertical terrain—for example, the use of a tree line or a ravine—may also achieve surprise. Weather conditions can also provide advantages for example, during periods of precipitation or fog. These conditions can cover movement, limit enemy observation, and help to achieve surprise.

3-11. Surprise is also easier to obtain for the force that knows the terrain and has the skills and equipment necessary to achieve greater mobility. Mountain operations are fought on foreign soil against an enemy normally familiar with the area. Leaders closely analyze the terrain to determine how it may be used from an enemy perspective. Leaders then determine how the terrain can best be used in conjunction with movement considerations (mounted, aerial, and ground) and maneuver support (reconnaissance and surveillance [R&S] units and assets, engineer support, fires) for an offensive advantage to help achieve surprise. With a proper analysis of the terrain, leaders can also determine likely or possible points of contact and develop and rehearse actions on contact to counter enemy actions.

CONCENTRATION

3-12. Concentration of combat power is essential in mountain operations. Commanders plan offensive missions that can quickly concentrate combat power on the enemy before they have a chance to escape or counterattack. Commanders use combined arms assets to target enemy positions, fixing and obscuring their forces. This enables the commander to maneuver the unit through gaps and to the flanks (rear) of the enemy to increase the effectiveness of their attack.

3-13. It is important to understand that mountain terrain and climate conditions that affect friendly forces similarly affect the enemy. When conditions are favorable and the assets are available, artillery and air assets brought to bear on an enemy defensive position or an enemy attempting to escape on foot through rugged mountain terrain can be devastating. Concentration of combined arms assets can help confuse the enemy, cause them to fight in more than one direction, and cause them to alter the planned actions, further exposing their vulnerabilities. Conversely, weather can affect the availability of fixed- and rotary-wing aviation assets as well as their ability to observe and engage targets effectively. Terrain and soil conditions can hinder delivery of artillery based on the angle of the projectile and type of round or fuze used.

TEMPO

3-14. Like surprise, tempo becomes increasingly difficult to maintain in the mountains as the terrain becomes more rugged and more restrictive. *Tempo* is the relative speed and rhythm of military operations over time with respect to the enemy (ADP 3-0). Following an effective movement and attack, the commander can better control tempo and has more options for continued actions. Maintaining momentum and tempo retains the initiative, keeps the enemy off balance, contributes to the security of the attacking force, and prevents the defender from taking effective countermeasures.

3-15. As in other environments, company commanders increase tempo by using simple plans, quick decision making, decentralized control, mission orders, and rehearsed actions. The enemy depends on the restrictiveness of the terrain to slow the tempo of friendly units while they delay and break contact to reposition in new areas within the mountain environment. In mountain environments, commanders use task organization and combined arms assets to help offset enemy actions and maintain tempo. Artillery and air

assets can deliver effective fires to maintain pressure on the enemy, allowing ground units increased time and space to maneuver. The commander may also consider—

- Attacking along a narrow front while frequently rotating the attacking element.
- Attacking along a narrow front to fix the enemy and, terrain permitting, using another element to maneuver to attack the enemy flank or rear.
- Attaching the mortar section or squads to the platoon with the main effort.

AUDACITY

3-16. Audacity is a simple plan of action, boldly executed. Boldness and calculated risks are key factors to successful offensive operations. In the mountains, commanders use initiative and innovative thinking to develop schemes of maneuver that capitalize on the other characteristics of surprise, tempo, and concentration. To achieve surprise, the commander may choose an unexpected axis or route of attack such as a difficult approach up a steep slope toward an enemy location.

3-17. An audacious commander plans offensive missions with calculated risks that allow the company to maintain the advantage, reduce friendly casualties, and accomplish the mission. The commander's actions, although quick and decisive, are based on a reasoned approach to the tactical situation, and on knowledge of the Soldiers, the enemy, and the unique considerations of mountain terrain.

SECTION II – CONDUCT OF THE OFFENSE

3-18. Commanders and subordinate leaders seize, retain, and exploit the initiative when conducting offensive operations. Even when conducting primarily defensive operations, taking the initiative from the enemy requires offensive operations that are force- or terrain-oriented. Force-oriented tasks focus on the enemy. Terrain-oriented tasks focus on seizing and retaining control of terrain and facilities.

ENVIRONMENTAL CONSIDERATIONS

3-19. A key factor in conducting offensive operations in mountain environments is first determining where the enemy is or suspected to be. It is extremely difficult to locate the enemy in rugged mountain terrain with physical characteristics (such as caves, rock formations, depressions, rifts, and wooded areas) that offer excellent cover and concealment to light Infantry or para-military forces with a small vehicle, sustainment and command and control (C2) footprint. The second major factor is determining an appropriate method to fix or place them in a kill zone where they can be attacked without their escaping.

3-20. As altitude increases in mountain environments, the terrain generally becomes more rugged and restrictive. This restriction drives most offensive combat operations to dismounted movements with smaller elements. Correspondingly, operations tend to become more decentralized and often take place at the platoon and squad-level. Junior leader initiative and decisiveness is essential during the conduct of these operations.

3-21. As with all offensive operations, the initiative is with the attacker. The attacker chooses the time, place and method of attack, while the defender must consider all possible methods and avenues of attack. With careful planning and preparation, units can execute effective attacks in the mountains. Understanding the enemy and how they use mountain terrain and weather to their advantage is crucial to developing a scheme of maneuver, and for creating clear tactical tasks with considerations for C2, time, and additional combat power to support the mission. Commanders and subordinate leaders who understand enemy mountain tactics are better able to use the characteristics of mountainous and cold weather regions to their advantage.

PLAN AND PREPARE

3-22. Commanders plan and coordinate offensive operations using available assets coupled with offensive tactics and techniques. Commanders must often create circumstances that allow the enemy to be attacked. Mountain offensive operations can be a challenge to companies fighting an indigenous enemy on unfamiliar soil. Planning mountain offensive operations for Infantry rifle companies and platoons use the same sequence and planning considerations found in ATP 3-21.10 and ATP 3-21.8 coupled with tactics and techniques unique to the rugged conditions of mountain operations.

3-23. Preparation consists of activities performed by the company to improve its ability to execute a mission. Preparation includes but is not limited to plan refinement, rehearsals, information collection, coordination, inspections, and movements. Thorough backbriefs and comprehensive rehearsals are important keys to refining a plan. Preparation activities play a critical role in ensuring that company and subordinate units can execute their mission effectively. These activities allow the commander, subordinate leaders, and each team or crewmembers to discover potential problem areas and to develop contingency plans to avoid unforeseen difficulties. (See ATP 3-21.10 and ATP 3-21.8 for the basic planning and preparations doctrine to conduct ground offensive combat operations.)

GENERAL CONSIDERATIONS

3-24. Mountain operations come with their own set of unique situations that commanders consider across the spectrum of operations. Movement and insertion techniques and methods that reduce the enemy's ability to observe are accounted for as is identification of likely enemy positions, possible ambush, and contact locations in the development of movement techniques, routes, and actions on contact in a compartmentalized and canalized terrain.

3-25. Impediments to face include possible degraded reaction times from other ground units and challenges for sustainment functions (resupply, medical evacuation [MEDEVAC] and casualty evacuation [CASEVAC]). Possible climate changes (weather, precipitation, wind, temperature) can occur quickly and can be extreme.

3-26. During mission planning for mountain operations, leaders normally plan to—

- Conduct a thorough reconnaissance.
- Conduct a terrain analysis to identify company and platoon routes, likely enemy contact (based on terrain and danger areas) and primary and alternate locations to cross-terrain obstacles.
- Identify a communications plan for degraded operations.
- Integrate fires to support maneuver, taking into considerations the different elevations in terrain for both the firing system and the target.
- Consider use of aviation or combat vehicles for insertion or extraction.
- Enforce a proper rest plan.

3-27. In a mountain environment, the terrain normally favors the defender. Company commanders may consider conducting limited visibility operations to reduce observation, increase stealth, and achieve a level of tactical surprise. With planning, detailed R&S, C2, and training, units can achieve significant tactical gains and decisive victories by exploiting limited visibility operations in mountain terrain. Imaginative and bold limited visibility operations can minimize the advantage of terrain for the defender and shift the balance of combat power to the side that can best cope with or exploit limited visibility.

CONSIDERATIONS BY WARFIGHTING FUNCTIONS

3-28. The company commander may use warfighting functions, supported by the capabilities added by organic or attached assets from Infantry brigade combat team (IBCT) or Infantry battalion, to aid in the planning, preparing, execution, and assessing of mountain offensive operations. General considerations are mentioned here with a detailed discussion of C2 in chapter 2, movement in chapter 5, and intelligence, fires, protection, and sustainment in chapter 6.

Command and Control

3-29. In mountain offensive operations, the company commander maintains C2 by positioning forward with the main effort and by direct leadership at the point of attack. The company commander locates a place to maintain a current and accurate picture of the company and exercise control of the elements as the attack progresses. The commander is prepared to exploit unforeseen advantages and anticipates the need or requirement to shift the effort due to success or to preserve the freedom of maneuver.

3-30. Execution of offensive mountain operations is often decentralized in nature. Companies commonly conduct operations in areas far from their parent unit and in terrain that is not easily accessible. In this type of environment, commanders control their elements both procedurally and actively as the situation permits, while allowing junior leaders the flexibility to adapt to changing and unforeseen circumstances.

Movement and Maneuver

3-31. Movement in mountain terrain can be either dismounted, mounted, or by air. Mounted movement may include tactical or other motorized vehicles. While movements may initially involve vehicles or aircraft, ultimately Soldiers need to dismount and move by foot to reach most terrain in mountain environments.

3-32. Leaders modify tactical movements in mountain terrain to accommodate terrain restrictions. Canalizing and restrictive terrain can force a unit into narrow movement routes, leaving little space for elements to spread out into typical movement formations. For ground movement to the objective, units are often limited to modified file formations on the narrow roads and trails. Route planning is essential prior to an operation. Commanders should consider the use of all available assets to assist in the evaluation of the terrain. Assets contributing information to aid in route selection may include maps, echelon-specific unmanned aircraft systems (UASs) acquired information, other intelligence assets and information, the use of advance elements, route reconnaissance conducted by attack reconnaissance helicopters, echelon-specific UAS firing platforms and information gathered from prior operations in the area.

3-33. Leaders determine and plan the use of key terrain for all offensive operations in the mountains and deny its use to the enemy. Key terrain may include a combination of terrain features that may give a marked advantage to either friendly or enemy units. Specific areas of higher elevation are often identified as key terrain while not all high ground is necessarily considered key. High ground may not be usable or accessible from either a friendly or an enemy perspective. The potential use of terrain should be analyzed from an enemy perspective and from the friendly perspective.

3-34. Movements should attempt to exploit known enemy weaknesses in their ability to detect friendly elements. For example, in some regions, the enemy has poor night vision technology. Although mounted movement during daylight is inherently safer from a terrain perspective, night driving can help reduce the chances of enemy engagements and improvised explosive device attacks. To decrease risks from both a terrain and enemy perspective, commanders should consider night movements.

Infiltration

3-35. Infiltration, accomplished by ground or air, depends on the unique circumstances of the mission, available resources, and the ability to maintain stealth and achieve surprise. When infiltrating by air, the noise from the aircraft reduces the element of surprise but facilitates movement and concentration of forces. A suitable landing zone (LZ) must be available as well to support the mission. Leaders should consider the use of multiple LZs, to confuse the enemy as to the objective of the action.

3-36. Cover and concealment, provided in mountain terrain, can be exploited by friendly small units, as well as the enemy. Leaders increase the probability of success by using terrain, weather, and modified movement techniques to their advantage. For example, rough unlikely routes used during periods of limited visibility to reduce the risk of detection by the enemy can increase the element of surprise. Limited visibility includes shadows or darkness as well as changes to climate causing clouds or fog.

3-37. Friendly small units may plan to use deception as part of their normal procedures while conducting offensive movement operations. If available, companies and subordinate units move in conjunction with other planned operations to conceal the true nature and purpose of their mission. For example, a platoon may conceal themselves inside routine supply vehicles for movement to an unobservable dismount location.

Overwatch

3-38. Establishing an overwatch for moving units is important to mission security and success during movement and maneuver. During planning, commanders identify key terrain features that include terrain needed for establishing overwatch of a bounding force. Most often, that terrain is located at a higher elevation. To compensate for the increase in vulnerability for compressed formations, units make maximum use of multiple routes coupled with security provided by an overwatching element during movements. Overwatching elements cover potential ambush sites along the exfiltration route to guard against enemy elements moving in after a unit passes. Return routes should be planned and varied, when possible, to increase security.

Actions on Contact

3-39. *Actions on contact* is a process to help leaders understand what is happening and to take action (FM 3-90). In the mountains, enemy contact, as described in ATP 3-21.8, includes any of the nine forms of contact (direct; indirect; nonhostile; obstacles; chemical, biological, radiological, or nuclear [CBRN]; aerial; visual; electromagnetic; and influence). Commanders and subordinate leaders plan and prepare for actions company personnel take after any form of contact. Mountain terrain often causes a deviation from the actions normally taken at lower elevations where maneuverability is easier, and options are greater. Units plan for actions on contact that include options for maneuver based on the restrictive terrain typical in mountain environments. During movements in mountainous terrain, employment of an overwatch element protects against unexpected contacts.

3-40. Commanders use all available information and intelligence to enhance operations and aid in unit protection. By planning for contact and changing the company movement technique, when necessary, the commander increases the unit's protection while decreasing the enemy threat. For example, commanders that use terrain analysis and other information and intelligence products to determine where and when an enemy ambush is likely to occur can avoid a surprise engagement and gain an offensive advantage.

3-41. When a unit makes contact, leaders quickly analyze each contact situation to determine immediate follow-on actions. Battle drills should be well thought out and practiced in advance to reduce the amount of confusion time needed for deciding follow-on actions. Delays in taking appropriate actions unnecessarily increase risk to Soldiers. It is extremely important to maintain momentum in the attack. The enemy attempts to slow or stop a friendly unit's advance by employing ambushes, obstacles, and fires. By developing and refining specific battle drills and tactical standard operating procedures (SOPs), units can quickly and decisively respond to enemy contact even in the most restrictive terrain.

Enemy Ambush

3-42. Mountain terrain is particularly suited for emplacement of ambushes. Enemy ambush sites often include low-lying areas with easily defended entry and exit locations. During movement planning for mountain operations, leaders need to pay particular attention to terrain that canalizes forces into potential enemy ambush sites. Narrow passes and valleys are often the only means to travel between locations without using long, indirect routes. An indigenous enemy is particularly aware of these areas and may use them to its advantage. The enemy may observe friendly small-unit movements on a route used during a particular mission and emplace an ambush on the same route as the unit returns. Considerations for avoiding an enemy ambush include—

- Having an overwatch unit observe friendly movements.
- Having available artillery or aviation assets cover unit movements when possible.
- Using available R&S assets (including manned and unmanned aircraft) to prevent enemy ambushes.
- Using alternate return routes when possible.
- Avoiding routines that set patterns.
- Using noise and light discipline at night.

3-43. The best counter-ambush technique is to destroy the enemy before friendly forces are exposed in the kill zone. This requires leaders to anticipate possible ambush positions and plan their counter actions. Soldiers should be constantly alert for the enemy and any signs of enemy activity such as wires, recently disturbed earth, and movement. When a subordinate leader identifies an ambush site the leader can call for fires, establish support by fire positions, and maneuver against the enemy's flank and rear if possible.

3-44. While dismounted, counter-ambush actions usually consist of actions based on battle drills followed by quickly planned and executed specific actions. Leaders plan and rehearse counter-ambush actions prior to the operation. During movement, friendly small-unit leaders constantly anticipate enemy contact and visualize their unit's actions on contact. Properly executed, battle drills have Soldiers seek cover, return fire, and possibly maneuver against the enemy, allowing the leader time to develop and execute a specific plan to destroy the enemy. While battle drills often involve seeking cover, returning fire, fixing, and maneuvering on the enemy, they are usually not sufficient to destroy a well-prepared enemy.

In anticipating and planning reactions to an ambush, the leader should understand that:

- Maneuver space may be limited.
- Attempting to break contact may further expose personnel.
- The terrain may restrict typical actions.

3-45. When mounted, unit actions may be even more restricted. Leaders should consider that if ambushed while mounted the best course of action (COA) might be to return fire and break contact. The time it takes to dismount and transition the combat power to maneuvering dismounted is often more detrimental to dismounted Soldiers than the unit breaking contact. It also may expose dismounted Soldiers in the kill zone. Ambushes initiated from a distance and from higher elevations are also sometimes more detrimental to dismounted Soldiers. Dismounting and maneuvering on foot to engage the aggressors over steep difficult terrain takes time; gives the enemy a chance to escape; and most likely increases risk to the Soldier. Commanders and subordinate leaders use indirect and aviation fires (planned or targets of opportunity) to attack the enemy as friendly mounted forces move out of contact.

Enemy Indirect Fire

3-46. A common tactic for an enemy operating in the mountains is to attack friendly forces with indirect fires. These attacks may range from the use of mortars to large-caliber artillery. The use of mortars, and light rockets, allow the enemy a long-range standoff distance from which they can engage friendly forces and then quickly leave before the unit can maneuver on them or return effective fire. To the advantage of U.S. Forces, these attacks may be less accurate and less effective than friendly force indirect fires due to fire missions shot in the direct lay mode. Many forces do not have the advantage of precision grid locations, fire direction centers, meteorological data, registration data, or the ability to stay in one place long enough to adjust fires accurately.

3-47. The enemy may tend to use the same firing positions over time, which is both an advantage and a disadvantage. An enemy without adequate indirect fire control can fire more accurately from a previously used position. By using the same position, they can become accustomed to setting up quickly and directly aiming their fires. During recent combat operations, friendly units have found mortar plates cemented in place to facilitate quick set up and targeting. The disadvantage for the enemy is that friendly forces can target these areas for quick counterfire should they detect fires from those locations. Units on patrol should record, template, and report potential enemy firing positions.

3-48. While leaders determine planned reactions to enemy indirect fires, units have found one of the most effective ways to counter enemy indirect fires is simply take cover, return fire to suppress the enemy, and attack them with indirect fires or aviation assets as quickly as possible. With U.S. Air Force close air support (CAS) (see JP 3-09.3) or Army attack aviation aircraft (see FM 3-04) in the air, enemy mortar fires often shut down quickly. Commanders can also attach mortars or assign priority of fires to Infantry small units thus making immediate responsive fires available to subordinate leaders.

Intelligence

3-49. During small-unit operations, the Infantry rifle company commander normally obtains intelligence preparation of the operational environment (IPOE) products from the battalion. The commander uses all available information collection assets, and internal assets to help consolidate information and study the terrain to determine the enemy's strengths, weaknesses, and probable COAs against the company and its subordinate units. During movement, the commander uses assets such as echelon specific UAS platforms to perform reconnaissance of the route, especially potential ambush sites.

3-50. Although the commander will not have complete information concerning the enemy intentions for a planned offensive action, of particular concern is whether the enemy is likely to organize a defense and maintain fighting subsequent to the initial contact. The enemy, if not interested in retention of terrain, often attempt to escape. Key to the success of this type of enemy engagement is the planned exploitation and pursuit of the enemy (see ATP 3-21.10). An enemy of this type attacks forces rather than fight to create contact situations that are more in its favor later.

Fires

3-51. A portion of the company's fire support, and those most responsive, is from mortar systems organic to the Infantry rifle company and Infantry battalion. (See ATP 3-21.90.) In addition, the commander plans supporting field artillery indirect fires, and when available, U.S. Army and U.S. Air Force aviation fires. The company commander and subordinate leaders plan fires along planned routes and target potential enemy ambush sites.

3-52. Fire support planning is an integral part of an offensive operation. Planned targets (scheduled and on call) and targets of opportunity (unplanned and unanticipated) are used to disrupt, destroy, fix, suppress, and neutralize the enemy (see ATP 3-21.20). Indirect fires (organic and nonorganic) and aviation assets enable operations specific to terrain restrictions and elevation constraints in mountain environments. Support from additional ground units often involves time-consuming and difficult movement to the point that it may become impractical.

3-53. Preparation fires are normally used during a deliberate attack, with fires placed on key targets before the assault begins. Indirect fires, integrated and synchronized with the company's direct fire plan, provide constant pressure on the enemy position, and prevent the enemy from reacting to, or repositioning against the attacking unit's assaulting elements. The commander weighs the benefits of preparation fires against the potential loss of surprise.

3-54. The commander employs supporting fires in the offense to achieve a variety of purposes. The commander suppresses enemy weapons systems that inhibit movement and fixes or neutralizes bypassed enemy elements. The commander obscures enemy observation or screens friendly maneuver. The company can take advantage of obscuration in various maneuver situations, such as during a bypass or in deception operations. The fire support plan, including obscuration, supports breaching operations. For example, the commander employs fires to obscure and suppress the enemy that is overwatching reinforcing obstacles. Illumination fires are included in contingency plans for night attacks and may include white light as well as infrared illumination.

Protection

3-55. A main concern in mountainous environments is the protection of the Soldiers within the company from the effects of the terrain and weather. During operations, commanders remain keenly aware of force health protection issues associated with operating in mountainous environments. Weather effects can have a severe impact on personnel and planned operations to the point that the risks to Soldiers may outweigh the benefits of continuing the mission. Commanders incorporate contingencies for changing weather conditions during offensive planning and preparation.

3-56. When an enemy air threat is present, the commander plans for and rehearses internal passive and active air defense measures. The commander anticipates possible contact with enemy aircraft by templating enemy helicopter and fixed-wing air corridors and avenues of approach. Coordinating instructions within the operation order or unit's SOPs, dictate internal air security measures and active air defense measures.

Sustainment

3-57. Sustainment assists maneuver elements in maintaining momentum during mountain and cold weather offensive operations. Company trains, positioned as far forward as the tactical situation allows, perform sustainment functions to ensure the company's freedom of action and prolong endurance. Company trains normally remain one terrain feature out of direct fire range of the enemy behind the location of the company. In mountainous environments where decentralized operations are common, company trains locate where best to support subordinate platoons in the accomplishment of the company's mission.

3-58. Company offensive operations that constitute a need for resupply during the mission may use a variety of transport means for delivery. These include the use of air movement aircraft, tactical vehicles, all-terrain vehicles, and pack animals, when practical.

EXECUTE

3-59. Offensive operations in mountain and cold weather environments follow the same four-step tactical framework as operations conducted in other environments (see ATP 3-21.8). The framework is for discussion purposes only and is not the only way of executing offensive operations. These steps overlap during the conduct of the offense. Normally the first two steps are supporting efforts, while the finish step is the main effort. Follow through is usually a sequel or branch to the plan based upon the situation. The four-step tactical framework of the offense during execution is—

- Find the enemy—intel drives fires and maneuver.
- Fix the enemy—prevent repositioning or reinforcement making them easier to destroy.
- Finish the enemy—mass available combat power to accomplish the mission.
- Follow through—defeat in detail, consolidate, reorganize, and transition.

FIND THE ENEMY

3-60. Gaining and maintaining contact with the enemy is vital to the success of offensive operations. The manner in which the company gains and maintains contact depends on whether they are in contact with the enemy's security zone or the enemy's main line of resistance. This typically involves making a physical reconnaissance of the objective using internal and external assets as the tactical situation permits. If available, echelon-specific UAS platforms can provide accurate real-time reconnaissance of the objective. It also involves making a map reconnaissance of the objective and all the terrain that affects the mission. Additionally, units should analyze aerial imagery, photographs, or any other detailed information about the mountain terrain for which the company is responsible.

3-61. The commander uses all available sources of information to find the enemy's location and dispositions to ensure the company is committed under optimal conditions. The enemy situation becomes clearer as the security elements conduct actions on contact to develop the situation rapidly in accordance with the commander's plan and intent.

Movement to the Line of Departure and Line of Contact

3-62. When attacking from positions not in contact, companies often stage in assembly areas and conduct tactical movement to attack positions behind friendly units in contact with the enemy. They then conduct passage of lines and cross the line of departure to begin the attack. When attacking from positions in direct contact, the line of departure is the same as the line of contact. In certain circumstances (noncontiguous mountain operations), there may not be a line of departure.

Approach to the Objective

3-63. The company commander plans the approach to the objective to ensure security, speed, and flexibility. The commander selects routes, techniques, formations, and methods that best support actions on the objective.

3-64. The commander employs techniques that avoid the enemy's strength when possible and conceal the company's true intentions. The commander tries to deceive the enemy as to the location of the main effort and uses surprise to maintain the initiative and a position of advantage when determining the time and place of the attack. The company uses an indirect approach, when available, to strike the enemy from an unexpected flank or the rear.

3-65. The effects of mountain terrain challenge movement and maneuver. Steep slopes, rock formations, and constant vertical changes to the landscape make movement and maneuver a difficult task. Units are often restricted to roads and trails, often confining movement to a column/file formation (see ATP 3-21.8). In mountainous environments, the enemy is generally able to observe most friendly movement formations and movement techniques used against that enemy. Due to the inherent risks associated with the enemy's use and knowledge of surrounding terrain, commanders conduct (based on mission analysis and when possible) most maneuver (and often movements) in the mountains with an overwatch element to provide security.

FIX THE ENEMY

3-66. Once contact is made, security forces and main body forces bring overwhelming fires onto the enemy to prevent the enemy, for example, from conducting a withdrawal, spoiling attack, or organizing a defense. Field artillery and mortar fires provide coverage throughout the initial phases of an offensive operation. The concentration of direct and indirect fires prevents the enemy from conducting and organizing a coherent defense. Overwhelming fires help disrupt the enemy's ability to conduct reconnaissance and security missions, organize a spoiling attack, effectively communicate, and control its forces. Once the process of disrupting the enemy begins, it continues throughout the offensive task.

3-67. During an offensive operation, the company fixes an enemy by physically occupying terrain or dominating access in and out of an area through direct and indirect fires. It may involve seizing mountainous terrain that dominates the objective so that the enemy cannot resupply, reinforce, or withdraw its defenders. Depending on the tactical situation, the company may occupy positions that isolate an objective by infiltration and stealth. The company commander does not allow the enemy to maneuver.

3-68. In mountainous terrain, the commander plans for aviation and indirect fires to fix an enemy force. This is primarily important when direct fires cannot target an area. A primary targeting purpose in fixing the enemy is to isolate the objective and prevent the enemy from maneuvering to reinforce the targeted area. The commander fixes the enemy with the minimum amount of forces.

FINISH THE ENEMY

3-69. During the offense, the company deploys rapidly to deliver the assault before the enemy can deploy or reinforce its engaged forces. The commander makes every effort to retain the initiative and prevent the enemy from stabilizing the situation by conducting violent and resolute attacks. Offensive maneuver seeks to achieve a concentration of effects at the decisive point, or at several decisive points if adequate combat power is available.

3-70. The company's objective may be terrain- or force-oriented. Terrain-oriented objectives require the company to seize or secure a designated area. During missions characterized by high altitudes, rapidly changing climatic conditions, and rugged terrain, terrain-oriented objectives become more likely than force-oriented objectives since mobility worsens, and the enemy seeks sheltered defensive positions. However, to gain a terrain-oriented objective often requires fighting through enemy forces. Commanders may use terrain-oriented objective areas to orient their forces onto likely enemy locations and shift as necessary to the enemy's actual location to achieve force-oriented objectives. Offensive missions conducted in mountainous environments are often noncontiguous operations, spread across great distances and force rather than terrain oriented. In areas with terrain- or force-oriented objectives, the enemy may be a stationary or moving force. Actions on the objective start when the company begins placing fires on the objective. This action usually occurs with preparation fires while the company is still approaching the objective.

3-71. Mountain terrain has an impact on the location of the assault positions. In severely restrictive terrain, the commander should consider establishing the assault position as close to the objective as possible. Long assaults across rugged terrain tire Soldiers and increase vulnerability.

3-72. The assault force quickly and violently executes the assault to maintain momentum to deny the enemy time to organize a more determined resistance. Enemy obstacles may slow or stop forward movement. Assaulting forces rapidly create a breach in an obstacle or redirect the flow of the assault over or around the obstacle.

3-73. After the assault, the company immediately reorients and continues the R&S effort beyond the objective. The company positions security elements (such as observation posts [OPs] or security patrols) to detect enemy repositioning, counterattack forces, and to look for exploitation opportunities.

FOLLOW THROUGH (CONSOLIDATE, REORGANIZE, AND TRANSITION)

3-74. *Consolidate* is to organize and strengthen a captured position to use it against the enemy (FM 3-90). The unit(s) providing the supporting effort(s) during the assault may or may not join the assault force on the objective. Planning considerations should include unit locations, sectors of fire, forces oriented on enemy counterattack routes, and provisions to facilitate transition to follow-on operations.

3-75. *Reorganization* is all measures taken by the commander to maintain unit combat effectiveness or return it to a specified level of combat capability (ATP 3-94.4). Reorganization, conducted concurrently with consolidation, occurs as necessary to prepare the unit for follow-on operations. Detailed planning provides the company with a plan for evacuating and recovering casualties, recovering damaged equipment, providing for prisoners of war, and integrating replacement personnel. As a part of reorganization, the company prepares for enemy counterattacks, the commitment of enemy reserves, and friendly forces follow-on missions. This includes repositioning mortars to extend organic indirect fire coverage, establishing security forward of the objective, covering likely enemy avenues of approach to the objectives, and shifting indirect fire targets to beyond the objective.

3-76. After seizing the objective, the commander has two main alternatives normally based on the commander's intent: exploit success and continue the attack or terminate the offensive operation. The company transitions to other operations and executes follow-on missions as directed by the higher headquarters commander. The company develops plans for follow-on missions based on the higher headquarters' plan, the higher commander's intent, and the anticipated situation.

ASSESS

3-77. The commander conducts assessments by monitoring the current situation to collect information, evaluating the progress towards achieving end state conditions or objectives, and recommending or directing actions to modify or improve the existing COA. The commander establishes priorities for assessment in planning guidance to subordinates, and by identifying decision points to avoid excessive analyses when assessing operations. Assessment by the commander is continuous; it precedes and guides every operations process activity and concludes each operation or phase of an operation.

3-78. Throughout the operations process (specifically troop leading procedures [TLP]) the commander integrates assessments with subordinates to assess the progress of the operation, thus enabling a common operational picture. The commander monitors and evaluates the current situation particularly that of significant threat activities along with changes in the operational environment.

3-79. The commander and subordinate leaders assess to understand the current situation and to exploit opportunities offered by a mountainous environment as they attempt to minimize its effect on the operations of personnel, equipment, and weapons. Proper training and operational experience in mountainous and cold weather regions are key to meet the challenges of these environments and having small-unit leaders prevent environmental injuries and illnesses. The commander manages risk to the mission and risk to Soldiers by assessing environmental hazards daily from subordinate leaders' updates.

SECTION III – SMALL-UNIT OFFENSIVE OPERATIONS

3-80. Offensive operations conducted by Infantry small units operating in mountain environments may include missions such as MTC, attack (hasty and deliberate), variations of attacks, or other common activities. Dismounted platoons and squad-level units generally conduct small-unit operations in higher elevation mountainous terrain. Terrain space restrictions often limit effective maneuver by larger units. While companies may conduct company-level operations or operations as part of a larger force, those engagements tend to be at lower elevations where the terrain allows for their movement and maneuver.

MOVEMENT TO CONTACT

3-81. In an MTC, company subordinate units attempt to gain contact with the enemy with the smallest possible force while providing flexibility for maneuver. The intent is to move in a way that avoids enemy detection and to attack any force within the capability of the friendly unit. Cordon and search, and search and attack techniques are subordinate tasks to an MTC. When involved in operations in support of stability operations tasks, unit offensive actions normally closely relate to these subordinate tasks of MTC (see ATP 3-21.10). Generally, the company or subordinate platoon conducts the search and attack technique when conducting MTC in a mountainous environment.

3-82. The commander conducts a search and attack technique when the enemy operates as small, dispersed elements. This technique is used when enemy locations cannot be determined to a targetable accuracy by methods other than a physical search or when the task is to deny the enemy the ability to move within a given

area. These type search and attack operations are characterized by robust R&S, and rapidly concentrated combat power to fix and defeat or destroy the enemy once located. In planning a search and attack, the commander can designate a reconnaissance force, fixing force, and finishing force. Once the enemy is located, a fixing force develops the situation and blocks potential enemy escape routes or maintains contact with the enemy. The finishing force then attacks and destroys the enemy. If the company or platoon conducts a search and attack on its own, the company commander or platoon leader ensures coverage of all associated tasks involved in the planning, preparation, execution, and assessment of the mission. A company or platoon conducts a search and attack to—

- Prevent the enemy from massing and organizing personnel or forces for hostile actions.
- Collect information about the enemy disposition and intent.
- Destroy or render the enemy combat ineffective.
- Prevent the enemy from operating unhindered in a given area.

3-83. Terrain that restricts friendly units to small elements will most likely restrict the enemy to sizes allowing for search and attacks to be conducted by platoon or smaller units. Units conducting a search and attack mission follow the same general guidelines as outlined in ATP 3-21.10. Considerations for conducting a search and attack in the mountains include—

- Using battalion and brigade combat team R&S assets to assist units in finding the enemy.
- Using indirect fire, aviation assets, or both to help fix and finish the enemy.
- Employing tactics for an enemy that may be very familiar with the terrain, are hard-to-find, and usually have good observation or current intelligence of friendly movements.
- Employing sustainment solutions for resupply of lengthy search and attack missions.

FINDING THE ENEMY

3-84. Commanders conducting offensive operations in mountain environments must first determine where the enemy is or suspected to be. It is often difficult to locate the enemy in rugged mountain terrain that offers excellent cover and concealment for light infantry or para-military forces with a small vehicle, sustainment and C2 footprint. The enemy may only initiate contact when it is to the enemy's advantage or to simply disrupt friendly operations. Finding an enemy in such an environment often requires—

- Support from the local population or a segment of the population.
- Rapid response to available combat information and intelligence data.
- Operations with armed local friendly forces familiar with the terrain and people.
- Constant small-unit actions in the area of responsibility such as patrolling and ambushes.
- Use of OPs and checkpoints.
- Manned and unmanned aerial reconnaissance and ground sensors.
- Intelligence support teams (ISTs) to filter, organize, and analyze data.

3-85. Reconnaissance forces and surveillance assets, at the company echelon, designated to assist in finding the enemy should be a small unit or asset that is able to move quickly and undetected. R&S may also include assets such as battalion and IBCT reconnaissance forces and surveillance assets, for example, electronic signal direction finding devices, UASs, and Army and Air Force aircraft. (See chapter 6 for additional information.)

FIXING THE ENEMY

3-86. Once the enemy is located and identified, the commander or subordinate leader should determine if an engagement with the enemy is within the capability of their units. Once that decision is made, the fixing force develops the situation and executes one of two options based on the commander's guidance and mission analysis. The first option is to fix the enemy by blocking identified routes they may use to escape. The second option is to fix the enemy in their current location until the finishing force can engage them.

3-87. Fixing the enemy involves decisively engaging them so that they cannot maneuver and cannot escape. In mountain terrain, the defender is often aware of friendly operations and movements. Fixing a dismounted enemy can be a difficult task. The enemy can escape detection or escape being fixed in place due to the cover and concealment provided by mountain terrain, the limitations on maneuver space, and the time required for friendly maneuver. Commanders should consider the use of indirect fires and aviation fires to hold the enemy

in place while finishing forces maneuver to conduct the attack. Attempts to fix the enemy in position to attack may be complicated if—

- The enemy breaks contact.
- The enemy uses stay-behind forces and long-range fires to slow and divert the attackers.
- Blocking forces cannot get in position in time.
- The enemy splits into smaller groups to break contact and escape from the area.
- Indirect and aviation fires cannot be observed.

3-88. Small-unit operations usually fix the enemy by maneuvering units into blocking positions then use fires to maintain contact and to block the enemy's escape routes. Constant pressure must be applied from first contact to destruction.

Blocking Positions

3-89. A blocking position is a defensive position sited to deny the enemy access to a given area or to prevent the enemy's advance in a given direction. Units occupying these positions must be large enough and with sufficient combat power to repel any attack from the enemy. Units can use infiltration techniques or use the available cover to move and occupy the blocking position. Aerial insertion allows units to quickly occupy a position with minimal time.

3-90. Positioning blocking forces in mountain terrain by way of ground movement is difficult. It is both time consuming and tiring to the Soldier. Since defending forces may be able to observe movement, opposing forces may lose the element of surprise. If movement by ground is necessary, blocking forces should use indirect routes and cover to avoid detection.

3-91. The commander may emplace blocking forces by air assault. Even if detected by the enemy, insertion by air is much quicker and much less exhausting. Adequate LZs for air insertion can be difficult to find in the mountains and may not be ideally located. Units should avoid LZs that are too far away from the blocking position, as they would negatively affect the advantages gained through surprise. Units may consider attempts of false insertions to confuse the enemy and deceive them on actual offensive operations.

3-92. Along with infiltration to the blocking position, commanders must also plan for exfiltration of the blocking force to include contingencies for exfiltration under fire if required. The commander should plan to shift the main effort to the blocking force if the fight is taken there by escaping enemy personnel. Shifting of indirect and aviation assets to support a change in the main effort is thoroughly wargamed during the planning process for the operation.

3-93. A complication to the use of blocking positions in the mountains is that the terrain can allow for enemy observation of approaching units and provides exceptional avenues of egress for escaping enemy personnel. Units should be alert for evaders using dry streams, tunnels, goat trails, mountain passes, and other terrain features to aid in their escape.

Direct and Indirect Fires

3-94. Direct and indirect fires may be more effective than blocking positions in the mountains for fixing the enemy in a location. Once enemy personnel are located through contact or intelligence, offensive action initiates, while immediate direct and indirect fires cause enemy personnel to seek cover while friendly forces maneuver. For example, if contact is made while on patrol and follow-on offensive actions are warranted, units can use their direct fire weapons to initially fix enemy personnel followed quickly by their organic 60-millimeter (mm) mortars fired in the direct lay, handheld mode (see ATP 3-21.90).

3-95. Fires from the 60-mm mortars are usually at the leader's discretion without clearance from higher authority. These mortar fires have proved to be greatly effective in the mountains due to their quick response time and ability to fire into unobservable areas. Infantry company commanders should consider attaching company mortars to the platoons for use in immediate responsive fires to help fix and kill enemy personnel in position.

3-96. Mortars fired in direct lay mode are quick and responsive but should be followed quickly by field artillery fires if available. Every Soldier should know how to call for fire (see ATP 3-21.8). Field artillery fires can greatly assist in fixing and killing enemy personnel in a combined arms offensive effort. If using

field artillery fires for fixing an enemy in the mountains, it is best to target avenues of egress enemy personnel are likely to use. Planned fires on these avenues can prevent enemy forces from escaping using those routes or may help channel them onto another route with a planned kill zone.

3-97. If available, other weapons systems such as the Javelin and the Improved Target Acquisition System can be used. These systems are used for long-range engagements of targets in fortified or heavily protected positions. These systems are employed where some means of transportation other than dismounted Soldiers are available for moving the equipment.

3-98. The commander should consider employing specially trained small units, such as sniper teams to infiltrate the area of operations (AO) prior to the attack to provide direct observation. They can also call for and adjust indirect fires and provide long-range direct fires.

FINISHING THE ENEMY

3-99. In the mountains, the finishing forces often include the use of all available assets including direct, indirect, and aviation fires. Ground and aerial observation of possible escape routes should be maintained as well as direct coordination between all ground and aviation assets to facilitate a quick response to enemy reactions.

HASTY AND DELIBERATE ATTACKS

3-100. As with most mountain and cold weather operations, conducting a hasty or deliberate attack can be more difficult than one conducted on and in less restrictive terrain and conditions. As elevation increases, mountain terrain and climate become increasingly restrictive on planning, preparing for, and executing offensive actions. Throughout the operations process, the commander and subordinate leaders track hazards and risks in a logical manner, and then share the resulting assessments (see ATP 3-21.10). For example, weather conditions can create specific hazards and risks during an attack. Common weather hazards to assess are cold, ice, snow, rain, fog, heat, humidity, wind, dust, visibility, and illumination.

3-101. During offensive operations, mountain and cold weather environments commonly favor the defender and limit the key element of surprise for the attacker. Positioning of a blocking force can also be difficult or impossible, requiring other alternatives to contain the enemy. For example, direct and indirect fires may be more effective than establishing blocking positions in mountainous terrain. For that reason, the commander carefully plans, coordinates, and executes fires to achieve the desired effect.

Note. The following example introduces a fictional scenario as a discussion vehicle for illustrating one of many ways that the Infantry rifle company can conduct a deliberate attack.

EXAMPLE – DELIBERATE ATTACK

3-102. The following example illustrates a deliberate attack conducted by an Infantry rifle company. Second Platoon, main effort, within the company moves through Assault Position Sam, seizes Objective Mark. First Platoon, supporting effort, establishes Support-by-Fire Position Dan (east of the main effort) in support of the company's main effort. Third Platoon, supporting effort, conducts air assault into LZ Pete, establishes blocking position east of Objective Mark in support of the company's main effort. Company mortar section establishes firing position vicinity Support-by-Fire Position Dan to support company's main effort. Company UAS (may be an echelon specific UAS firing platform) conducts screen northeast of Objective Mark during consolidation and reorganization on the objective.

3-103. Example of company deliberate attack sequence of events (See figure 3-1 on page 46). Company deploys to conduct a deliberate attack, seizes Objective Mark. Lift and attack helicopters refuel at forward arming and refueling point and move from Pickup Zone Jake, not illustrated. First Platoon and Second platoon conduct road march (mounted) to dismount points, not illustrated.

First Platoon (with alternate command post [CP]) and Second Platoon (with primary CP) conduct infiltration from dismount points to objective area. The following events are conducted simultaneously:

- First Platoon (with attached mortar section) establishes Support-by-Fire Position Dan, initiates support-by-fire.
- Mortars begin preparation fires on Objective Mark.
- Third platoon conducts air assault into LZ Pete, establishes blocking positions vicinity LZ Pete.
- Second Platoon conducts maneuver through Assault Position Sam.
- Second Platoon attacks northeast to seize Objective Mark.
- Army attack aviation (on order) destroys enemy withdrawing into Engagement Area (EA) Jim from Objective Mark.
- Second Platoon consolidates and reorganizes on the objective.
- Company UAS screens to the northeast of Objective Mark.

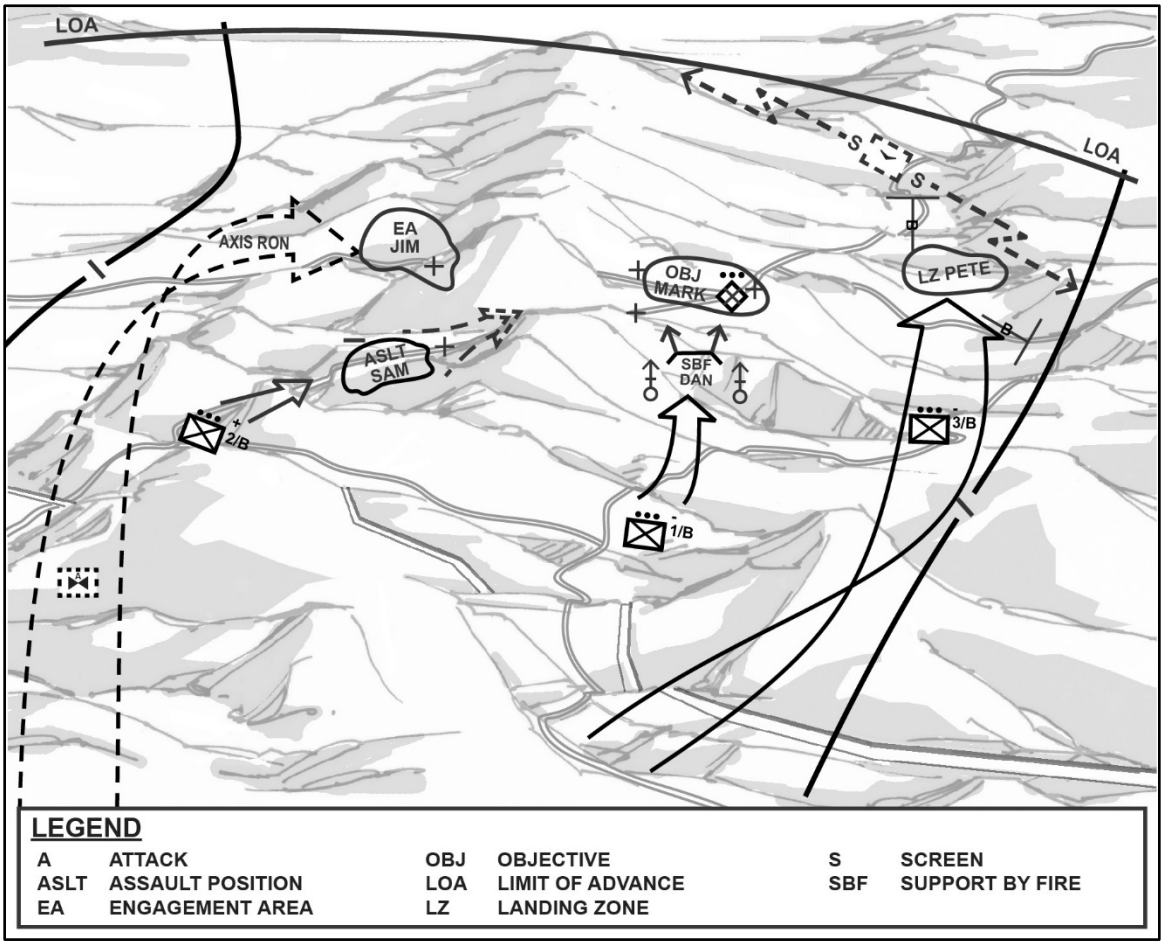


Figure 3-1. Company deliberate attack, example

3-104. Hasty attacks, characterized by speed, flexibility, and surprise, are often not possible in mountainous and cold weather regions. For example, restrictive mountain terrain can limit the advantages of these characteristics, driving commanders to conduct deliberate as opposed to hasty attacks in the mountains. The increased time for preparation during a deliberate attack allows for careful planning, preparation, and coordination of all aspects of the attack, including indirect fires, the use of aviation assets, route planning, timing of event sequencing, and overall C2. The following paragraphs address planning considerations unique to hasty and deliberate attacks, although not inclusive, topics include—

- Use of terrain and weather by friendly and enemy forces.
- Negotiation of natural and man-made obstacles.
- Use and availability of combat multipliers.

USE OF TERRAIN AND WEATHER BY FRIENDLY AND ENEMY FORCES

3-105. When planning an attack, the commander views the terrain from the enemy's perspective. In mountain environments, the enemy generally attempts to control terrain that denies the attacker avenues of approach such as roads, trail networks, valleys, dry streambeds, and other less restrictive terrain. To control these areas the enemy seeks control of key terrain in the surrounding high ground including ridgelines, hills, peaks, and rock formations where, if occupied, they can influence operations. Leaders should analyze the terrain and plan to deny these areas to the enemy in their scheme of maneuver.

3-106. Taking advantage of weather conditions and the terrain is critical in mountain operations. Without their use, the enemy is routinely aware of friendly force movements. Mountain weather conditions, such as overcast conditions or fog, can be effectively used to the Infantry small-unit's advantage while conducting an attack. Terrain features also aid in covering and concealing friendly movements. Movement through unobservable terrain such as dense vegetation, rock formations, and depressions limit observation. While use of these conditions is necessary, movement in rough terrain during limited visibility conditions slows movement rates and increases the risk of Soldier injury from trips and falls. Some limited visibility conditions may also affect aviation and other combat multipliers.

NEGOTIATION OF NATURAL AND MAN-MADE OBSTACLES

3-107. The commander conducts a careful analysis of potential obstacles during the planning process for an attack. The attacking force moves as quickly as possible along unobstructed routes to the objective area. A simple map reconnaissance is often not adequate as some features that are extremely difficult to negotiate in mountain terrain may be barely visible on a map. Information gained from ground and aerial R&S coupled with information from units or Soldiers that previously traversed the area can help in identifying obstacles. The commander identifies alternate routes or requests support assets to cross or breach obstacles when an obstacle cannot be quickly negotiated.

USE AND AVAILABILITY OF COMBAT MULTIPLIERS

3-108. Supporting assets, such as indirect fires and aviation, are closely coordinated prior to the attack. The commander plans targets along friendly avenues of approach, in the objective area, and along potential enemy escape routes. Aviation assets are pre-positioned away from the objective area to maintain surprise and flexibility. Communications channels are coordinated for with direct voice communication between the aircraft(s) and the ground unit prior to and during the attack. Due to the effects of the terrain and weather, the commander realizes that planned and coordinated support assets may not be available. For this reason, the commander always plans alternative methods to accomplish the mission.

VARIATIONS OF ATTACKS

3-109. Variations of the attack are ambush, counterattack, raid, and spoiling attack. As variations, they share many of the planning, preparation, execution, and assessing considerations of the attack. The most likely variations of the attack assigned to an Infantry small unit (company or subordinate platoon) in mountainous and cold weather regions is an ambush or raid. The commander conducts a raid or ambush to capture or destroy the enemy at a particular location, at a particular time, and then leaves the area. An ambush allows for covert observation of the enemy and can be a viable option to attempting to locate and attack an enemy hiding in difficult mountain terrain. Raids and ambushes commonly target the enemy, equipment, and operations rather than attempt to hold mountain terrain. Paragraphs 3-110 through 3-123 address small-unit offensive techniques for an ambush and raid specific to mountain and cold weather operations. (See ATP 3-21.10 and ATP 3-21.8 for the basic doctrine to conduct ground combat operations during an attack or variation of attack.)

RAID

3-110. A raid is a limited-objective variation of an attack that entails swift entry into hostile terrain followed by a planned withdrawal to a friendly location and is not intended to hold terrain. (Defined in paragraph 3-8.) A raid conducted in mountainous terrain targets a specific known or suspected enemy location within enemy occupied territory. Raids are conducted to destroy, disrupt, or interdict known enemy C2 nodes, sustainment locations, or assembly areas. They are conducted separately or in conjunction with other operations.

3-111. In mountain operations, the enemy may hide in caves and tunnel systems. Direct observation often confirms the exact location and presence of the enemy entering or leaving these locations. Like friendly forces, the enemy must eat, drink, and obtain needed supplies. This requires the enemy to leave these secure hiding places at some point, allowing observed enemy activities. Once a location is identified, direct observation should confirm the best time for the raid to be conducted on the position. Observation can help determine time patterns and enemy strengths.

3-112. The commander and subordinate leaders consider the unique aspects of conducting a raid in mountain terrain and under cold weather conditions and use caution while planning the withdrawal of friendly forces at the conclusion of the operation. Primary and alternate withdrawal routes and means of extraction are planned to protect friendly forces from counterattack and ambush.

Note. The following example introduces a fictional scenario as a discussion vehicle for illustrating one of many ways that the Infantry rifle company can conduct a raid. This illustration primarily focuses on the Infantry battalion's main effort, Company B conducting a raid, along with supporting subordinate units within the battalion. (See ATP 3-21.10 for a detailed illustration of this scenario.)

3-113. This scenario illustrates a raid conducted by the Infantry rifle company. Company B, main effort, within the Infantry battalion conducts the company raid (see figure 3-2). Company A, supporting effort, conducts an area ambush (west of the main effort) in support of the battalion main effort (see paragraph 3-119 for illustration). Battalion Sout Platoon and Company D, supporting efforts, conduct screen and guard missions forward of Company B objective area to protect and provide early warning to the battalion's main effort (not illustrated). Battalion mortar platoon, supporting effort, moves with Company D. Mortar Section, priority of fires goes to the main effort (Company B), order of priority after the main effort: Company A, Company D, Battalion Scout Platoon (not illustrated). Company C, supporting effort (east of the main effort), with two platoons (First and Second platoons) and mortar section, conducts area ambush in support of the battalion's main effort (not illustrated). Third Platoon Company C is the Battalion Reserve Force (not illustrated).

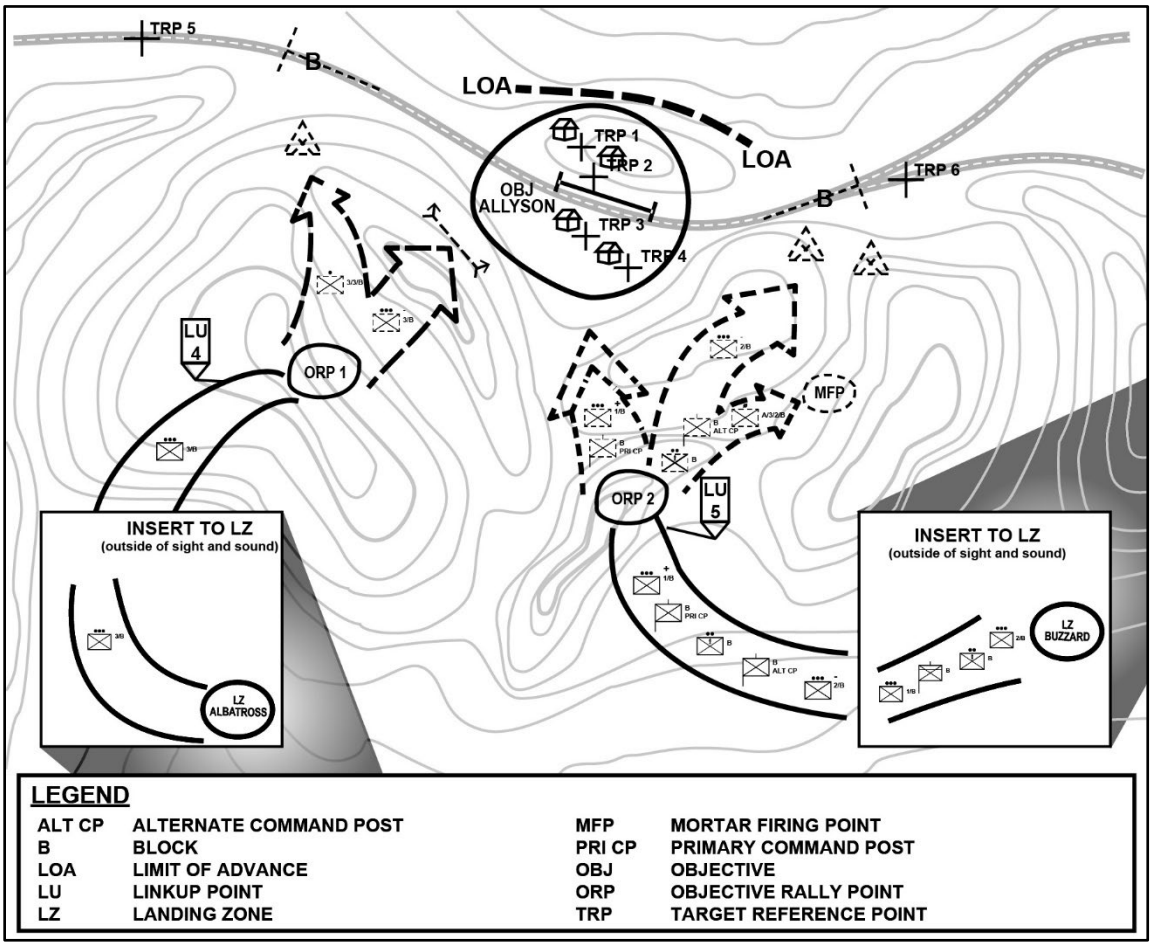


Figure 3-2. Company raid (insertion/infiltration), example

3-114. After inserting into LZ Buzzard (Company B-Minus) and LZ Albatross (Third Platoon), company elements move undetected to two linkup points then to Objective Rally Point 1 and Objective Rally Point 2, respectively. Once closed on objective rally points, security elements for the raid employ before other forces to ensure security is established prior to the support element, and assault element moving. The support element moves into position once security elements are established in their blocking positions. The commander considers the objective to be isolated once security, support, and indirect fire assets are prepared to execute their tasks. The assaulting force begins movement forward from Objective Rally Point 2 to the assault position(s) as security and support position finalize their movement into position. During assault force movement, if security and support elements are not yet in position as the assault force closes on the assault position(s), the assault force stops in the assault position until both elements are prepared to execute the raid. If security and support elements are ready to execute the assault force does not stop in the assault position. The support element initiates fires, on order, or as assault forces cross the assault position(s).

3-115. The attack begins with overwhelming force and surprise to overwhelm the enemy. Considerations unique to mountain and cold weather regions continue in much the same way for the raid as addressed in the deliberate attack highlighted earlier in this chapter. Specialty teams in both types of attacks execute their assigned tasks once friendly forces seize the objective (Objective Allyson in this example) and the assault has culminated. The commander calls for the execution of a well-rehearsed exfiltration plan once actions on the objective are complete. The assault force moves from the objective, along a different axis (when possible) than the route used to infiltrate. The commander orders the support element to exfiltrate from their support position and move to a Pickup Zone Eagle (not illustrated) once the assault element has moved off the objective. Once the commander is satisfied that the support elements is moving, security elements move from

their respective locations. Security elements exfiltrate from their blocking positions while ensuring they are not pursued. This exfiltration plan normally happens in rapid succession that exercises speed and security.

AMBUSH

3-116. The commander and subordinate leaders conduct an ambush (defined in paragraph 3-8) in mountain terrain using the same procedures and mission analysis as in any other location. In the same manner as the Infantry rifle company, the restrictive terrain often confines the enemy to habitual paths such as roads, trails, and footpaths. Direct observation, combat information, and intelligence can indicate where and when the enemy is likely to travel and help identify a suitable location for an ambush.

3-117. Key to establishing an effective ambush in the mountains is covert movement to the ambush site. The use of limited visibility conditions can aid in covering these movements. Another technique to consider for disguising movement to an ambush site is to use a stay-behind ambush. Assuming the enemy is monitoring all movement for example vehicles that normally carry one squad or carry supplies can load them with an extra squad used in the ambush. At some point during the movement, the ambush squad dismounts in an unobservable manner while the others continue with a separate mission or return to base. Planners should look for terrain characteristics such as high ground above a potential ambush site. Along with other considerations such as adequate clear fields of fire into the kill zone, leaders should capitalize on the increased advantages the terrain offers. Often, in lower elevations, crossing fires between friendly units may result in fratricide. In the mountains, it is often possible to avoid potential danger from friendly crossing fires by positioning personnel on high ground elevations on both sides of the kill zone.

3-118. The commander and subordinate leaders also consider the use of an ambush as part of a defense plan for a unit location if the availability of personnel supports their use. An ambush that employs the use of items such as command-detonated claymore mines or networked munitions may require fewer personnel. This type of ambush may be an alternative if personnel strength is limited.

Note. The following example introduces a fictional scenario as a discussion vehicle for illustrating one of many ways that the Infantry rifle company can conduct multiple ambushes. This illustration primarily focuses on the Infantry battalion's supporting effort; Company A conducting three ambushes, along with supporting subordinate units within the battalion. (See ATP 3-21.10 for a detailed illustration of this scenario.)

3-119. The following scenario illustrates an area ambush conducted by an Infantry rifle company. Company A, supporting effort, conducts the area ambush (west of main effort) in support of the battalion's main effort. Company B, main effort, within the Infantry battalion conducts a company raid (see paragraph 3-113). Battalion Scout Platoon and Company D, supporting efforts, conducts screen and guard missions forward of Company B objective area to protect and provide early warning to the battalion's main effort (not illustrated). Battalion Mortar Platoon, supporting effort, moves with Company D. Mortar section, priority of fires goes to the main effort (Company B), order of priority after the main effort: Company A, Company D, battalion Scout Platoon (not illustrated). Company C, supporting effort (east of the main effort), with two platoons (First and Second platoons) and mortar section conducts area ambush in support of the battalion's main effort (not illustrated). Third Platoon, Company C is the battalion reserve force (not illustrated).

3-120. After mission analysis, the company commander determines the ambush task organization and the task and purpose for each platoon. The commander determines the most like enemy force is an enemy motorized rifle platoon with dismounts (two squads) moving in a column along the road within the company's AO. The commander concludes that first and third platoons will cross attach antiarmor teams (Javelin close combat missile system [CCMS] or M3 Multi-role, Antiarmor, Antipersonnel Weapon System [MAAWS] teams) to facilitate second platoon's combat power to destroy the enemy in the central ambush's kill zone. The three platoons conduct point ambushes directed at accomplishing different goals. While they aim to achieve a collective desired end state, they have differing engagement criteria. The commander identifies potential contingencies regarding the engagement criteria that may drive how platoons react if a larger and more equipped force arrives at the ambush, or if enemy contact is made prior to the ambush.

3-121. Within this example, platoon elements move alone platoon infiltration routes to designated release points. Platoons move through these designated release points (not illustrated) to platoon Objective Rally

Points 1, 2, and 3. As the lead elements of the platoons cross these release points, the information is passed to the commander. The commander and first sergeant (1SG) (primary CP) move with Second Platoon (company main effort). The executive officer (XO) (alternate CP) and mortar section move with Third Platoon (supporting effort). As platoons move into and establish their respective objective rally points, the commander orders the mortar section to establish Mortar Firing Point 1 between Objective Rally Points 2 and 3 to provide supporting fires during the three leaders' reconnaissance. (See figure 3-3.)

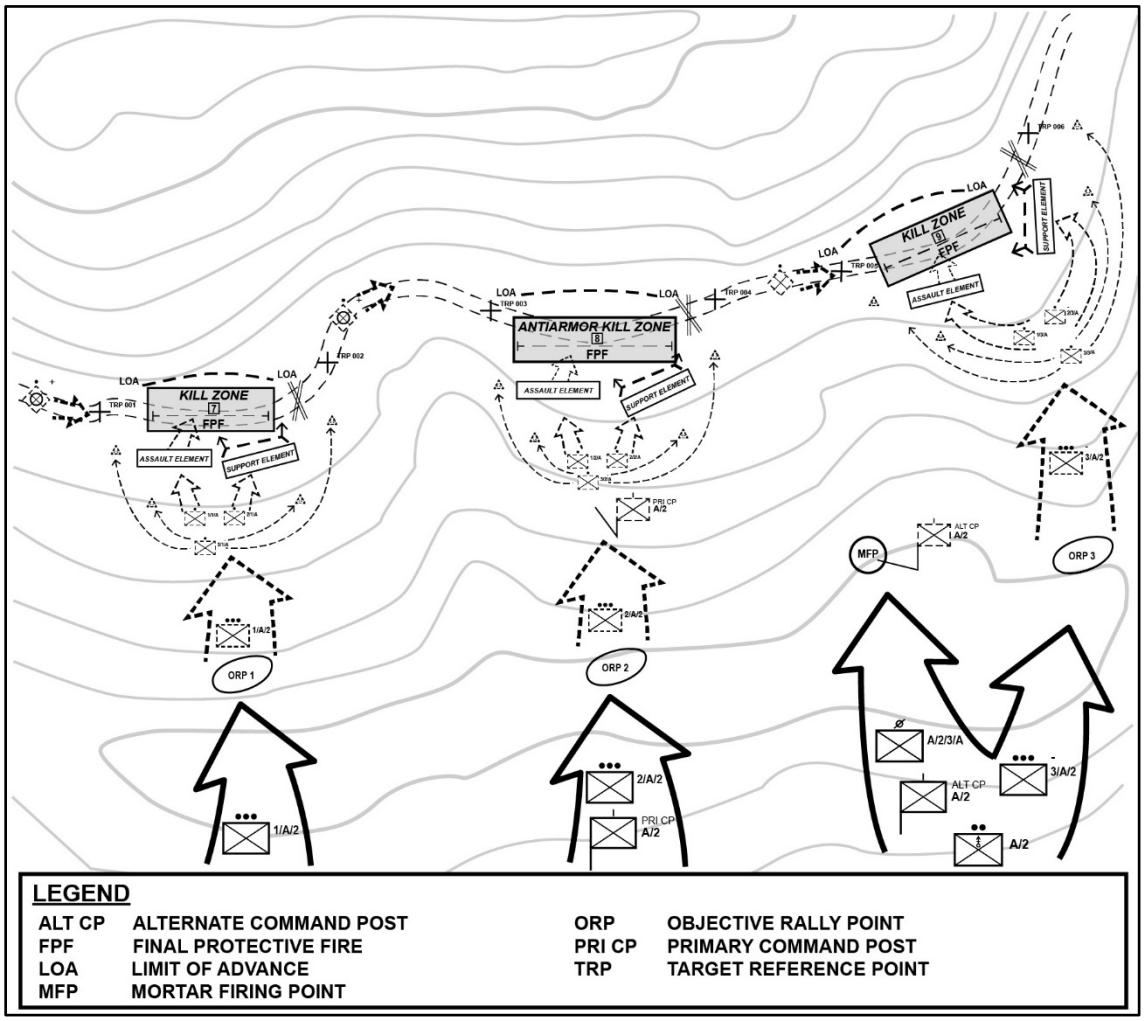


Figure 3-3. Company multiple ambushes (infiltration/occupation), example

3-122. Subordinate platoons and elements occupy the three objective rally points in much the same way as an assembly area, and a patrol base (see ATP 3-21.8). Once all platoons and elements have closed within their respective objective rally points, the commander directs all platoons to begin their leader's reconnaissance. Platoon leaders emplace appropriate surveillance, and both the left, right, and rear security elements while on the leader's reconnaissance. In this example, leaders emplace surveillance on each ambush site, but security elements are not emplaced at this time.

3-123. Prior to the enemy's arrival into the kill zone(s), the commander monitors the reports generated by the platoons of the enemy activity at their respective ambush sites. The enemy is templated to move through First Platoon's area before arriving in the central antiarmor ambush kill-zone. First Platoon and Third Platoon have engagement criteria that are different from that of Second Platoon based upon the mission variables of METT-TC (I) previously discussed. Once engagement criteria are met within the central ambush site (Second Platoon) antiarmor kill zone the ambush is executed. The commander then receives reports that the enemy forces that were short of the central kill-zone broke contact back toward First Platoon's ambush location.

First Platoon initiates its ambush once engagement criteria are met within its kill zone, destroying the remaining enemy.

3-124. As the area ambush continues, the commander receives a report that additional forces are moving toward First Platoon's ambush site to reinforce the enemy ambushed force. While Second Platoon is finishing its search of the kill zone, First Platoon security forces forward of the area ambush establish visual contact of the mounted threat. The platoon leader reports to the commander that the enemy force is too large for their organic weapon systems to destroy. Based upon engagement criteria, the platoon leader reports that they would be able to delay the movement of enemy force towards Second Platoon's location by engaging with mines and shoulder launched antitank four munitions, then immediately break contact. The commander assesses the progress of Second Platoon's search and movement from the ambush site and decides that First Platoon will execute that contingency, to include, execution of linear target 7.

3-125. Upon First Platoon's engagement and breaking contact, the company initiates the preplanned linear target to mask First Platoon's withdrawal to Objective Rally Point 1. Simultaneously, Second Platoon has withdrawn and closed in on Objective Rally Point 2. Third Platoon moves back to Objective Rally Point 3. Once all platoons close on objective rally points, they consolidate and reorganize to begin movement along platoon exfiltration routes to the company linkup well away from the sights and sounds of the company's area ambush.

Chapter 4
Defense

While U.S. operations are inherently offensive in nature, defensive operations are necessary to support offensive operations, or for protection or security as designated by the mission. Commanders should remember that enemy actions might range from major unit attacks as were encountered during the Korean War at Pork Chop Hill to Combat Outpost Keating in Afghanistan where limited assaults or harassing fires typical accrued while in support of stability operations. This chapter discusses defensive tactics, techniques, and procedures (TTP) and how the physical characteristics of mountains operations support and enhance defensive missions.

SECTION I – DOCTRINAL BASIS FOR THE DEFENSE

4-1. As in offensive operations, small-unit defensive techniques cannot be discussed in isolation. There must be a seamless continuity and understanding between the fundamental doctrinal principles, tactics and procedures covered in Army field manuals, specifically FM 3-96, and the techniques covered in Army techniques publications, specifically ATP 3-21.10. This section briefly discusses defensive operations and the characteristics of the defense.

DEFENSIVE OPERATIONS

4-2. A *defensive operation* is an operation to defeat an enemy attack, gain time, and develop conditions favorable for offensive or stability operations (ADP 3-0). There are three types of defensive operations—area defense, mobile defense, and retrograde. (See FM 3-96 and ATP 3-21.20 for a detailed discussion of each of the three types of defensive operations.) The most likely defensive operation assigned to an Infantry small unit (company or subordinate platoon) is an area defense. (See ATP 3-21.10 and ATP 3-21.8 for the basic doctrine to conduct ground combat operations during an area defense.) Section III addresses small-unit defensive techniques for area defense specific to mountain and cold weather operations.

Note. The three types of defensive operations have significantly different concepts and pose significantly different problems. Each defensive operation is dealt with differently when planning and executing the defense. Although, the names of these defensive operations convey the overall aim of a selected defense, each typically contains elements of the other and combines static and mobile elements. As with offensive operations, defensive operations can result in nonphysical effects, such as those generated in the information environment. For example, the use of deception in support of operations security can be highly effective at gaining time and tactical deception can support the economization of forces. (See ATP 3-21.10 for the basic doctrine to conduct ground combat operations for each of the three defensive operations.)

AREA DEFENSE

4-3. The *area defense* is a type of defensive operation that concentrates on denying enemy forces access to designated terrain for a specific time rather than destroying the enemy outright (ADP 3-90). The focus of the area defense is retaining terrain where the bulk of the defending force positions itself in mutually supporting, prepared positions. Units maintain their positions and control the terrain between these positions. The defeat mechanism is normally the massing of combat power to destroy the enemy in engagement areas (EAs). Area defenses are conducted when—

- Directed to defend or retain specified terrain.
- Forces available have less mobility than the enemy does.
- The terrain affords natural lines of resistance.
- The terrain limits the enemy to a few well-defined avenues of approach.

- There is time to organize the position.
- Conditions require the preservation of forces.

Note. An *engagement area* is an area where the commander masses effects to contain and destroy an enemy force (FM 3-90). (See ATP 3-21.20, ATP 3-21.10, and ATP 3-21.8 for further information on EA development.)

VARIATIONS OF THE AREA DEFENSE

4-4. The three variations of the area defense (defense of a linear obstacle, perimeter defense, and reverse-slope defense) have special purposes and unique consideration associated with each. When conducting a variation of the area defense, proper evaluation and organization of the company's area of operations (AO) are essential to maximize the effectiveness of the defending force. The commander exploits the advantages of occupying the terrain where the battle will occur and positions the company to engage the attacker from locations that give the defending force an advantage. These locations may include defilades, rivers, thick woods, swamps, cliffs, canals, valleys, built-up areas, and reverse-slopes. In all three forms, the commander uses existing and reinforcing obstacles and other key terrain to impede the enemy's movement. The commander selects terrain that allows massing friendly fires but forces the enemy to commit forces piecemeal into friendly EAs, exposing portions of the enemy force for destruction without giving up the advantages of fighting from protected positions. The three variations of the area defense provide distinct advantages to the defender and its subordinate units during an area defense and the operations of the fixing force during a mobile defense. (See ATP 3-21.10 and ATP 3-21.8 for additional information.)

POSITION SELECTION

4-5. The commander may choose between two methods for the positioning of units when planning an area defense: a defense in-depth or a forward defense. The company commander usually selects the method, but the higher headquarters' commander may define the general defensive scheme for the battalion. These two employment choices are not exclusionary. Part of a defending unit can conduct a forward defense, while the other part conducts a defense in-depth. The specific mission may also impose constraints such as time, security, and retention of certain areas, which are significant factors in determining how the unit defends. A defense in-depth is the preferred option when tactical conditions allow. Defense in-depth reduces the risk of the attacking enemy penetrating the defense and affords some initial protection from enemy indirect fires. In the forward defense, the company normally participates as part of a larger element in the forward defense. When the commander defends forward in an area defense the battalion employs most of its combat forces near the forward edge of the battle area. (See ATP 3-21.10 and ATP 3-21.8 for additional information.)

SITUATIONS UNIQUE TO THE CONDUCT OF DEFENSIVE OPERATIONS

4-6. During the conduct of defensive operations, situations requiring denial operations, defending encircled, and stay-behind operations have their own unique planning, preparation, and execution considerations. In the defense, denial operations conducted to deprive the enemy of some or all of the short-term benefits of capturing an area may be required. In other defensive situations, the Infantry battalion may become encircled and a subordinate company to the battalion may be directed to conduct operations as a stay behind force. These actions may be planned or forced by the enemy. In addition to the actions addressed in paragraphs 4-7 through 4-13, paragraphs 4-14 and 4-15 discuss relief in place and linkup between friendly ground forces specific to these actions and selected forms of maneuver specific to the offense. (See ATP 3-21.20 and ATP 3-21.10 for additional information.)

Denial Operations

4-7. *Denial operations* is actions to hinder or deny the enemy the use of terrain, supplies, or facilities (FM 3-90). This may include destroying, removing, and contaminating those supplies and facilities or erecting obstacles. The commander designs denial operations to deprive the enemy of some or all of the short-term benefits of capturing an area. Denial operations differ from countermobility operations that use or enhance the effects of natural and man-made obstacles to deny the enemy freedom of movement and maneuver.

Defending Encircled

4-8. An element when encircled can continue to defend, conduct a breakout from encirclement, exfiltrate toward other friendly forces, or attack deeper into enemy-controlled territory. When defending encircled, the defender normally establishes a perimeter on restrictive terrain, ideally controlling a choke point or other key terrain. A company or platoon may find itself encircled because of offensive actions, as a detachment left in contact, when defending a strong point, when occupying a combat outpost, or when defending an isolated defensive position.

Breakout From an Encirclement

4-9. A *breakout* is an operation conducted by an encircled force to regain freedom of movement or contact with friendly units (ADP 3-90). A breakout is both an offensive and a defensive mission. Prior to encirclement, when possible, the commander reorganizes the encircled force for breakout based on available resources. The commander typically organizes the encircled force to conduct rupture, follow-and-assume, main body, and rear-guard missions. The company or other subordinate element within performs one or more of these missions. When a company performs a breakout from an encirclement, platoons or subordinate elements within the company generally organize into a rupture force, main body force, and rear-guard force.

Exfiltrate Toward Other Friendly Forces

4-10. When the possibility of massing sufficient combat power to create a rupture during breakout seems remote or if another force cannot relieve a friendly unit, an exfiltration during periods of reduced visibility and in close terrain may offer the greatest probability of success. An *exfiltration* is the removal of personnel or units from areas under enemy control by stealth, deception, surprise, or clandestine means (JP 3-50).

Note. *Exfiltrate* is a tactical mission task in which a unit removes Soldiers or units from areas under enemy control by stealth, deception, surprise, or clandestine means (FM 3-90). Friendly forces exfiltrate when enemy forces have encircled them, and other friendly forces cannot relieve them. In addition to being encircled by enemy forces, units returning from a raid, an infiltration, or a patrol behind enemy lines can also conduct an exfiltration.

Attack Deeper Into Enemy-Controlled Territory

4-11. When the possibility of conducting a breakout or exfiltration from encirclement seems remote, attacking deeper into enemy territory may be a course of action (COA) that the enemy is not likely to expect. The previously encircled force may attack deeper to seize key terrain, disrupt the enemy's offensive action, locate to more favorable defensive terrain, or provide an opportunity for linkup from another direction or extraction point. Attacking deeper is only feasible if the company can sustain itself while isolated, or when that sustainment can come from aerial resupply and enemy supply stocks.

Stay-Behind Operations

4-12. A *stay-behind operation* is an operation in which a unit remains in position to conduct a specified mission while the remainder of the force withdraws or retires from an area (FM 3-90). A stay-behind force may also result from enemy actions that bypass friendly forces. The main purpose of a stay behind force is to destroy, disrupt, and deceive the enemy. A stay-behind force is a high-risk mission because of the danger that it will be located, encircled, and destroyed by the enemy. When it is unlikely that an encircled company or subordinate element is able to breakout or exfiltrate the entire force, part of the force may stay behind to create a diversion or perform a detachment left in contact mission. The Infantry rifle company is especially suited to conduct stay-behind missions in complex terrain. The company takes advantage of such terrain, using situational obstacles to enhance the effects of natural obstacles to deny enemy freedom of movement and maneuver. Restricted and severely restricted terrain offers cover for the movement of company elements and favors using ambushes against the enemy. Elements of the company are best suited to exfiltrate by means of dismounted movement or air movement once the stay behind operation concludes.

4-13. As part of a defense, a company conducting a stay behind operation may occupy hide positions well forward of the forward edge of the battle area. As the enemy passes, the elements of the company attack the

enemy through a series of raids and ambushes. The intent of these attacks may be to attrit the enemy or to cause enemy follow-on forces to be more cautious and to slow down to clear possible attack and ambush sites.

Relief in Place

4-14. A relief in place is an operation in which, by direction of higher authority, all or part of a unit is replaced in an area by the incoming unit and the responsibilities of the replaced elements for the mission and the assigned zone of operations are transferred to the incoming unit (Army uses the term AO in place of zone of operations). Normally, the Infantry rifle company conducts a relief in place as part of a larger operation, primarily to maintain the combat effectiveness of committed forces. The battalion or higher headquarters directs when and where to conduct the relief and establishes the appropriate control measures. Normally, during the conduct of combat operations, the unit relieved is defending. However, a relief in place may set the stage for resuming offensive operations or serve to free the relieved unit for other tasks.

Linkup

4-15. A *linkup* is a type of enabling operation that involves the meeting of friendly ground forces, which occurs in a variety of circumstances (FM 3-90). Linkup operations happen when an encircled company or subordinate unit breaks out to rejoin friendly forces or exfiltrates towards friendly forces, or when a force comes to the relief of an encircled element. During the conduct of defensive and offensive operations, linkups happen when forces conduct forward or rearward passage of lines or battle handover. During infiltration, through or into an area occupied by enemy forces, attacking forces conduct linkup when two infiltrating elements in the same or different infiltration lanes or in an AO are scheduled to meet to consolidate before proceeding on with their missions.

CHARACTERISTICS OF THE DEFENSE

4-16. Characteristics of the defense include disruption, flexibility, maneuver, mass and concentration, operations in-depth, preparation, and security. (See FM 3-96 for a detailed discussion of each characteristic.)

DISRUPTION

4-17. Defensive plans aim at disrupting the enemy's planned operations and upsetting their tempo and synchronization, ability to mass fires, reconnaissance and security forces, and main body formations. Counterattacks, indirect fires, obstacles, and retention of key or decisive terrain prevent the enemy from concentrating their strength against portions of the defense. Well-coordinated defense plans assist in early disruption of enemy offensive actions.

FLEXIBILITY

4-18. The defense requires preparation in-depth, use of reserves, the ability to shift the company's main effort, supplementary positions within the defense, and the ability to counterattack. In the mountains, an analysis of how the enemy may use mountain terrain in the offensive allows commanders and subordinate leaders to anticipate enemy actions and prepare flexible contingencies.

MANEUVER

4-19. Maneuver allows the commander to achieve a position of advantage over the enemy, mass and concentrate combat power, and to take full advantage of terrain. In the mountains, maneuver space is often limited depending on where the defense is located. The commander includes these limitations in the defensive plan while still using available maneuver space to achieve a position of advantage over the enemy.

MASS AND CONCENTRATION

4-20. Defenders shape and decide the engagement by massing the effects of combat power in time and space and accepting risk in some areas to mass effects elsewhere. The concentration of combat power at the decisive time and place is key to a successful defense. In the mountains, defensive operations are often area defenses conducted from battle positions and strong points where the retention of terrain is critical. To support these types of defenses, the company commander integrates the massing of combat power in the defensive plan.

Massing effects include the use of air, indirect and direct fires that can shift to critical points rapidly to provide destructive effects, such as targeted final protective fires. Massing effects requires effective command and control (C2) with redundancy in communications, and engagement criteria for artillery, mortars, air assets, and crew-served weapons.

OPERATIONS IN-DEPTH

4-21. Simultaneous application of combat power throughout the depth of the defender's AO allows for the destruction of the enemy with attacks to its flanks, as that enemy force is most exposed and vulnerable. The commander positions subordinate forces in mutually supporting positions in-depth to absorb enemy penetrations. When the terrain allows, the defending force canalizes the enemy into prepared EAs, defeating the enemy's attack by concentrating the effects of overwhelming combat power. In mountainous terrain, defending forces have the advantage of preparing the terrain by reinforcing natural obstacles and fortifying position. Defending forces positioned in-depth, enable the piecemeal commitment of enemy forces, to defeat in detail and to force the enemy to fight where the enemy does not want to fight. For example, open areas dominated by higher terrain may offer adequate cover and concealment for the defending force throughout the depth of an AO.

PREPARATION

4-22. Preparation, an inherent strength of the defense, provides the defender time to study the ground and select positions that allow the concentration of forces and the massing of fires on likely approaches. In noncontiguous mountain operations, companies and platoons often defend from a strong point or battle position. A perimeter defensive plan is commonly established and coordinated with all available assets. Preparations for the defense do not cease but rather improvements continue and plans refined for the entire time the company or subordinate element is in position. The commander or subordinate leader takes advantage of the available time to conduct thorough preparations for a defense. Through the proper selection of terrain and reinforcing obstacles, defending forces can direct the energy of the enemy's attack into terrain of their own choosing. Preparation of the ground consists of plans for maneuver, and counterattack plans. It also includes preparation of positions, routes, obstacles, logistics, and C2.

SECURITY

4-23. Security efforts in mountain environments depend largely on early warnings of pending enemy actions to allow reaction time for the defending force. Security efforts are planned to protect the defender against all acts designed to, or which may, impair the defender's effectiveness to deceive the enemy as to friendly locations, strengths, and weaknesses, inhibit or defeat enemy reconnaissance, provide early warning, or to disrupt enemy attacks early and continuously.

SECTION II – CONDUCT OF THE DEFENSE

4-24. As with the offense, commanders and subordinate leaders seize, retain, and exploit the initiative when conducting defensive operations. Infantry small units use the defense to occupy and prepare positions, consolidate forces and mass the effects of fires on likely avenues of approach or mobility corridors. While the offense is the most decisive type of combat operation, the defense usually is the stronger type.

ENVIRONMENTAL CONSIDERATIONS

4-25. The design of the mountain landscape, coupled with climatic conditions, creates a unique set of mountain operations characterized by close fights with dismounted Infantry, decentralized small-unit operations, degraded mobility and increased movement times, restricted lines of communications, and operations in thinly populated areas. The focus of the defense is retaining terrain where the bulk of the defending force, when possible, positions itself in mutually supporting, prepared positions. During decentralized small-unit operations units maintain their positions and control the terrain between these positions.

Note. U.S. Forces operating in mountain and cold weather environments, for example during counterinsurgency, may possess more advanced weapons and equipment than the enemy. Knowing this, enemy offensive tactics commonly involve short violent engagements followed by a hasty withdrawal through preplanned routes. They often strike quickly and fight only as long as the advantage of the initial surprise is in their favor. Attacks may include direct and indirect fires, and/or explosive hazards (for example, improvised explosive devices) used against stationary or moving forces. This type of technology overmatch is not necessarily the case in other engagements, example those involving larger scale ground combat operations against a peer threat.

4-26. Infantry small units, in mountainous and harsh climatic conditions, conduct defensive operations to resist, defeat, or destroy an enemy attack in order to support subsequent offensive operations. Commanders and subordinate leaders use defensive operations to withstand an enemy attack while preparing to seize the initiative and develop conditions favorable for transitioning to offensive operations. During a defense, these forces withstand enemy attacks and hold the enemy while preparing to seize the initiative and transition to offensive operations or other operations in support of stability operations tasks. A thorough understanding of the commander's intent is especially critical in defensive operations, which demand precise integration of all elements of combat power.

PLAN AND PREPARE

4-27. As in all operations, defensive operations are planned and coordinated using available assets in a synchronized and coordinated plan. Planning defensive operations in mountainous terrain for Infantry small units use the same planning and preparations considerations found in ATP 3-21.10 and ATP 3-21.8 coupled with TTP unique to the rugged conditions of mountain operations and those operations in harsh cold weather conditions. Since time is a factor in all operations, the commander conducts a time analysis early in the planning process to determine what preparation activities need to take place and when to begin those activities to ensure forces are ready and in position before execution. The plan may require the commander to direct subordinates to start necessary movements; conduct task organization changes; begin reconnaissance, surveillance, and security operations; and execute other preparation activities before completing the plan.

GENERAL CONSIDERATIONS

4-28. Unique planning considerations for mountain defensive operations include—

- Defensive plans for a 360-degree perimeter defense in a noncontiguous mountain environment.
- Enemy avenues of approach through canalized terrain, typically dismounted.
- Economy of force considerations along unlikely enemy avenues of approach, particularly those with terrain features too difficult to negotiate without considerable time and equipment.
- Noncontiguous assigned areas without mutual supporting direct fires with adjacent units.
- Use of air and indirect fires to support the defensive plan in regards to elevation.
- Employment of engineer assets to aid in position construction to increase survivability and protection and to emplace tactical obstacles along channelized enemy avenues of approach.

Priority of Work

4-29. Establishing a defensive position in mountainous terrain and cold weather require the same priority of work areas as the basic doctrine to conduct defensive ground combat operations listed in ATP 3-21.10, chapter 3 and ATP 3-21.8, chapter 3. Paragraphs 4-30 through 4-36 provide further information on priorities unique to mountain and cold weather regions.

Key Weapons Positions

4-30. Careful selection of key weapons positions should cover likely mounted and dismounted avenues of approach. Anti-armor weapons require adequate space and ventilation for backblast and cover vehicular trafficable avenues while machine guns and squad automatic weapons cover dismounted avenues of approach. When possible, machine guns and squad automatic weapons are placed near ground level to increase grazing fires. Key weapon systems should be mutually supporting.

Fields of Fire

4-31. Ensuring clear fields of fire may sometimes be a challenge in mountain environments. Loopholes, aiming stakes, sector stakes, and target reference points can help in direct and indirect fire target engagements. Commanders and subordinate leaders plan to cover unobservable dead space, for example, with grenade launchers or mortars.

Avenues of Approach

4-32. Commanders and subordinate leaders identify and secure likely avenues of approach including subsurface avenues. Though mountain terrain, main or likely avenues of approach are often clearly identifiable, considerations must be given to less likely more difficult avenues as well.

Stockpiling of Supplies and Equipment

4-33. Depending on the type of defensive operation, stockpiling Class I (rations and water), Class III (fuel and petroleum, oil, and lubricants), Class IV (construction and barrier materials), Class V (ammunition), and Class VIII (medical supplies), may be required. Additional items may include communications equipment (wire, directional or retransmission [RETRANS]), pioneering tools, and firefighting equipment.

Barriers and Obstacles

4-34. The commander, in coordination with higher headquarters and subordinate leaders, identifies locations for and construction of barriers and emplacement of obstacles to deny enemy access on both likely and unlikely avenues of approach. The availability of resources and the unique characteristics of the terrain are key factors in determining the positioning of barriers and obstacles. The commander integrates barriers and obstacles with key weapons, covered by observation and fire (both direct and indirect). Barriers and obstacles comprised of two types, natural (mountains, thick vegetation, streams, gullies, cliffs, and so forth) and man-made (fences, walls, gates, vehicle barriers, wire, mines, and so forth) are planned. When possible, units conceal obstacles from enemy observation, erect in an irregular pattern to hinder enemy movement, employ in-depth, and tie in with existing obstacles.

Routes

4-35. Movement routes between positions should be improved and marked if possible as well as the routes to alternate and supplementary positions. In mountain terrain, this may require emplacing special equipment such as ropes and ladders for rappelling and climbing.

Security Positions

4-36. The commander plans for and establishes positions for observation posts (OPs) and other ground, air, and space surveillance assets to ensure observation and surveillance of key enemy avenues of approach (see paragraph 5-83). Manned or unmanned surveillance assets are key enablers to surveil less likely and more difficult avenues for enemy ground movement.

Security Operations

4-37. As the commander and subordinate leaders drive key preparation activities. The company is often most vulnerable to surprise and enemy attack during the conduct of defensive preparation activities. The commander and subordinate leaders are away from their units and concentrated together during rehearsals. Parts of the company could be moving to task organize. Required supplies may be unavailable or being repositioned. Security operations—screen, guard, and area security—are essential during preparation. Subordinate elements of the company assigned security patrol missions and establish local security (see ATP 3-21.8, chapter 7) to protect the company while it prepares for future operations.

Combat Outpost

4-38. Using a *combat outpost*, a reinforced observation post capable of conducting limited combat operations (FM 3-90), is a technique for employing reconnaissance and security forces in restrictive terrain that

precludes mounted reconnaissance and security forces from covering the assigned area. While mission variables determine the size, location, and number of combat outposts a unit establishes, a reinforced platoon typically occupies a combat outpost. These mission variables are found in METT-TC (I), which stands for mission, enemy, terrain and weather, troops and support available, time available, civil considerations, and informational considerations. A combat outpost must have sufficient resources to accomplish its designated missions, such as conducting aggressive combat patrolling and reconnaissance patrolling. Combat outposts are established when OPs are threatened by insurgency or in danger of being attacked by enemy forces infiltrating into and through the company's assigned AO.

Note. During the conduct of defensive-focused operations, the commander uses a combat outpost to extend the depth of the security area, to keep friendly forward OPs in place until they can observe the enemy's main body, or to secure friendly forward OPs that are encircled by enemy forces. Mounted and dismounted forces can employ combat outposts.

Cordon Security

4-39. Extremely complex mountain ranges make it normally not feasible to secure all points along a route by physically allocating resources to all the points of the route. *Cordon security* is the security provided between two combat outposts positioned to provide mutual support (ATP 3-91). Units assigned to these combat outposts provide response forces in the event of enemy activity along the route within their subordinate AO. Forces based at these combat outposts conduct reconnaissance patrols and offensive actions between their base combat outpost and adjacent combat outposts designed to counter enemy activities between these two points on a frequent but irregular schedule. The outpost commander rotates personnel between duty at the combat outpost and duty on patrol.

Considerations by Warfighting Function

4-40. The company commander may use warfighting functions to aid in the planning, preparing, and execution of mountain defensive operations. General considerations are mentioned here with a detailed discussion of C2 in chapter 2, movement in chapter 5, and intelligence, fires, protection, and sustainment in chapter 6.

Command and Control

4-41. Compartmentalized terrain, expansive AO, and severe environmental conditions limit communications systems and challenge C2 efforts. Large operational areas and the need to employ small-unit tactics require commanders to decentralize and disperse their forces. Timely, clear, and concise warning orders enable subordinates, operating in harsh conditions, ample time to prepare and plan for operations. Mission orders that empower subordinates and promote freedom of action allow small unit leader to react to rapidly changing climatic conditions, and rugged terrain. Commander's intent that clearly articulates the purpose, key tasks, and desired end state enhances any mission's success. Command relationships that are clearly understood facilitate the exercise of initiative by subordinates (unity of command where possible, unity of effort where it is not). Tactical standard operating procedures (SOPs) adopted, understood, and applied across the command enable small-unit operations in any environment. Defensive plans established with ample flexibility allow the commander to shift assets in response to enemy actions and reactions to contain the enemy's attack.

Movement and Maneuver

4-42. Mountain terrain plays a major role in determining how a unit defends. Movement corridors, or terrain where movement is more common and less restrictive, are often easily identified by friendly and enemy units. Mountain terrain often restricts maneuver to identifiable locations and restricts movement by lengthening the time it takes to traverse a particular piece of ground.

4-43. Leaders plan for a terrain rather than an enemy oriented defense of a static position aimed at slowing, disrupting, and stopping enemy attacks before their final assault. Mobile reserves or reaction forces are

trained to move quickly across rough compartmentalized terrain with tailored loads while effective weapons are those positioned on key mountain terrain features that offer good flanking fires on an attacking force.

4-44. Canalized, restricted maneuver space is accounted for when identifying primary, alternate, supplementary, and subsequent positions during a defense using battle positions. Defensive plans are formulated according to positions the company intends to hold such as forward operating bases and combat outposts or other bases.

Intelligence

4-45. Planning and directing information requirements and the information collection plan is critical in the restrictive terrain of mountainous environments and the harsh conditions of cold weather environments. Mountain environments (generally categorized as an area where altitude, relief, and weather) significantly degrade normal military activities. Such degradation increases the importance of emplacement and utilization of information collection assets. Information collection planning (for both the offense and defense) in mountainous areas must take into consideration an increased reliance on aerial collection assets and degraded target acquisition and early warning and collection capabilities of intelligence systems. (See ATP 3-90.97 for more information.)

Fires

4-46. Company commanders plan integration of available fires into the defensive plan. Coordinated fires from indirect fires and Army aviation and Air Force fires are essential in defensive operations in mountain environments as support from reinforcing ground units may come from some distance away. Preplanned fires from internal and external indirect fire assets can help deliver an initial blow to an enemy attack while air assets are in route to assist. Air and indirect fires should be synchronized with direct fires, obstacles, and counterattack plans.

4-47. Elevated points, such as crests and trees, are often used for OPs. Landmarks and prominent terrain features should be avoided as these are probably targeted. When selecting an OP, the observer must consider the characteristics of forward slope (military crest) versus reverse-slope positioning including:

- Advantages of the forward slope position include—
  - The view of the front and flanks is better.
  - Fires impacting on the topographic crest do not neutralize the position.
  - The hillside provides background, which aids in concealment.
- Disadvantages of the forward slope position include—
  - Difficulty in occupying during daytime without disclosing the position.
  - Radio communications may be difficult and require remoting radios to the reverse-slope.
  - Cover from direct fire may not be available.
- The advantages of a reverse-slope position are—
  - It may be occupied in daylight.
  - Greater freedom of movement is possible.
  - Communications installation, maintenance, and concealment are easier.
  - Protection from direct fire is available.
- Disadvantages of the reverse-slope position are—
  - The field of view to the front is limited.
  - Enemy fire adjusted onto the topographic crest may neutralize the OP.

Protection

4-48. Commanders consider the use of protection measures from direct fires, indirect fires, and air attack while establishing defensive plans. In mountain environments, establishment of some of these protection measures often call for the use of external assets for many positions. Engineers are often needed to assist in the emplacement of obstacles and to dig in or build up a position. It is extremely difficult to dig into rocky mountain terrain and protection. Building up a position rather than digging it in often improves protection. In mountain environments where defensive operations are often associated with established bases such as combat outposts or forward operating bases, heavy equipment is commonly used to build walls and overhead

protection. Given the characteristics of mountainous terrain, heavy equipment may not be available to support operations.

4-49. Protection from air attacks by air defense assets focus on likely air avenues of approach for enemy aircraft. They can provide area coverage in and around a defensive position. Air avenues of approach tend to be more restrictive in mountain environments. Mountain ridges may be too high for aircraft to cross, requiring approaches that more closely correspond to the enemy's ground avenues of approach. Mountain ranges also aid in protection from a rear approach of a unit oriented toward a valley or depression. Considerations should include possible landing zones (LZs) enemy aircraft may use. Units should always consider the use of both passive and active air defense measures to aid in protection.

Sustainment

4-50. Planning considerations at the company-level begins with the concept of logistic support at the battalion level. The company executive officer (XO) in collaboration with the company first sergeant (1SG) and the company supply noncommissioned officer (NCO), evaluate the company's mission in terms of requirements to accomplish the mission and shortfalls. The XO, the logistical planner of the company, bases the company's requirements according to the logistics status reports sent by each subordinate element within the company. The 1SG and the supply sergeant synchronize all resources and resupply them through the 64 company trains. The method of distribution of supplies is METT-TC (I) mission, enemy, terrain and weather, troops and support available, time available, civil considerations, and informational considerations, driven either unit distribution, supply point distribution or a combination of both, but regardless of the method chosen it requires prior coordination with the forward support company.

4-51. Due to the increase in time associated with moving across rugged terrain or at high altitude, logistic support is forward positioned as close to the supported unit as possible. When established, a forward operating base is likely supported by intermediate support bases and main supply hubs.

4-52. Sustainment considerations for defensive operations in mountain environments are like those for the offense. Commanders may consider stockpiling supplies and ammunition (for example, preplanned logistics packages of supplies, particularly Classes V, III, IV, IX, and VII) to support engagements where resupply may be hindered. Procedures for the care and evacuation of wounded personnel while conducting a defense should be included in the defensive plan. Other considerations include cross-training and interoperability, waste management, accountability, security, aviation support, and seasonal challenges. (See chapter 6 for more information.)

EXECUTE

4-53. The immediate objective of a mountainous defense is to deny the enemy access to key terrain that helps them conduct further operations. Forces are likely to position at key terrain such as passes, road junctions, built-up areas, or adjacent high ground. However, enemy elements can bypass these defensive positions and attack from the flank or rear. Therefore, it is necessary to defend in terrain that restricts and contains the enemy as well as to control the high ground that dominates this terrain. The terrain provides the defender with cover, concealment, and camouflage that can deceive the enemy regarding the strength and disposition of friendly forces. The defender should know the terrain, control the heights, fortify positions, site weapons in advance, stockpile supplies, and prepare lateral trail networks to allow for mobility.

4-54. An Infantry rifle unit conducts the defense performing several integrated and overlapping activities. As in the offense, defensive operations are typically executed in a four-step tactical framework. The framework is for discussion purposes only and is not the only way of executing defensive operations. Normally the first two steps are supporting efforts, while the finish step is the main effort. Follow through is usually a sequel or branch to the plan based upon the situation. These steps may not occur sequentially; they may occur simultaneously. These steps are—

- Find the enemy—intel drives fires and maneuver.
- Fix the enemy—prevent repositioning or reinforcement making them easier to destroy.
- Finish the enemy—mass available combat power to accomplish the mission.
- Follow through—defeat in detail, consolidate, reorganize, and transition.

FIND THE ENEMY (SECURITY AREA ACTIONS)

4-55. Once security area forces have moved into the security area, actions in the security area predominantly focus on reconnaissance, counterreconnaissance, target acquisition, reporting, destruction, delay of the enemy main body, and battle handover. Friendly forces (platoon battle positions) in the main battle area integrate their actions with security area forces (elements of the battalion scout platoon and sniper squad) forward of them, maintaining information flow and security (see figure 4-1). As the enemy approaches, the battalion commander may desire to leave elements of the security force forward to preserve observation and targeting.

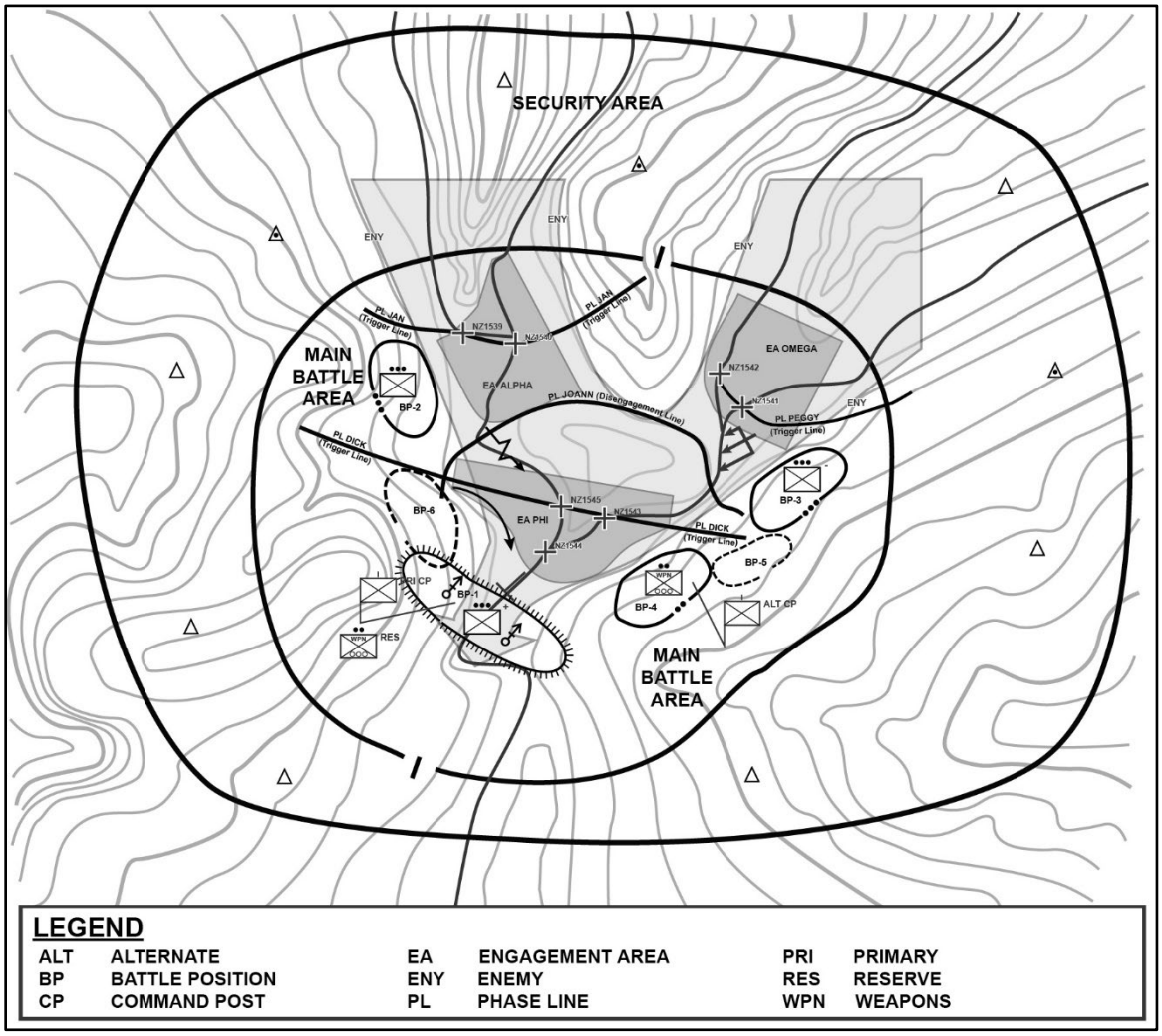


Figure 4-1. Area defense (security area activities)

4-56. Information collection within the security area provides the commander with information to support decision-making, to provide early warning and reaction time, and to support targeting. Guided by the commander's critical information requirements, information collection help provides the following information:

- Location, movement, and destruction of enemy reconnaissance and security forces and surveillance assets.
- Speed, direction, composition, and strength of enemy formations.
- Locations of high-payoff targets (for example, indirect fire, bridging, and C2 assets).

- Enemy actions at decision points.
- Enemy flanking actions, breaching operations, and force concentrations.
- Battle damage assessment.
- Movement of follow-on forces.

4-57. As the enemy's attack begins, reconnaissance and security forces identify committed enemy unit positions and capabilities, determine the enemy's intent and direction of attack, and gains time to react. The company commander uses the information available, in conjunction with military judgment, to determine the point at which the enemy commits to a COA. The commander analyzes the information and the effect on its role in the defense and adjusts the plan and disseminates information to subordinate elements. In an area defense, critical decisions for the commander normally include—

- Initiation and employment of direct and indirect fires against enemy formations.
- Modifications or adjustments to the defensive plan.
- Execution of situational and reserved obstacles.
- Withdrawal of forward security forces.
- Commitment of the reserve, counterattack, or both.

FIX THE ENEMY (SECURITY AREA ENGAGEMENT)

4-58. Engagements in the security area normally are limited. *Counterreconnaissance*—a tactical mission task that encompasses all measures taken by a unit to counter enemy reconnaissance and surveillance efforts (FM 3-90)—forces focus on locating and destroying enemy reconnaissance elements. As the enemy closes into the area, observers initiate indirect fires and the execution of reserved obstacles. The focal points are normally early warning and identification of the enemy's main and supporting efforts, strength, and composition of threat forces, and direction of attack so the commander can make decisions and position forces. In the event enemy reconnaissance and security forces and surveillance assets penetrate the security area, forces operating in the security area must be prepared to conduct target handover with the main battle area forces.

4-59. After making contact with the enemy, (first in the security area and second in the main battle area) the commander seeks to disrupt the enemy's plan, the enemy's ability to control forces, and the enemy combined arms team. Ideally, the results of the battalion commander's supporting efforts should force a disorganized enemy, whose ability to synchronize its elements has been degraded, to conduct a movement to contact (MTC) against prepared platoon defenses within the company's area defense. Once the process of disrupting the attacking enemy begins, it continues throughout the defense of the battle area. The battalion commander may choose to use assault platoons to engage enemy formations at longer distances under the control of the battalion, the weapons company, or other security force commander (rifle company commander). The rifle company commander should have a clear and concise understanding of the battalion commander's intent on using task organized assault platoons. The commander also ensures that these elements are not decisively engaged, and that they retain their ability to maneuver. These forward units also call for close air support (CAS), Army attack aviation, and precision guided munitions from artillery and mortars. Security area engagements can provide the following advantages:

- Depth to the AO.
- More time to prepare in the main battle area.
- A weakened enemy.
- Confusion to the location of the friendly defensive positions.
- Forces the enemy to deploy and more clearly indicate their main attack or intentions.

FINISH THE ENEMY (MAIN BATTLE AREA ENGAGEMENT)

4-60. In an area defense, the *main battle area* is the area where the commander intends to deploy the bulk of their unit to defeat an attacking enemy (FM 3-90). The commander shapes and decides the engagement by massing the effects of combat power. Depending on the defensive scheme of maneuver, the defender may fight primarily from a single series of positions (see figure 4-2) or it may conduct delay operations capitalizing on movement and repeated attacks to defeat the enemy in-depth. Forward positioned forces, obstacles, and fires are used to break the enemy's momentum, force the enemy to deploy earlier than desired, reduce the enemy's numerical advantage, disrupt enemy formations and tempo, and force the enemy into

positions of vulnerability. The defender masses fires and integrates obstacles to disrupt, turn, fix, block, canalize, and then destroy attacking enemy forces in EAs throughout the depth of the defense.

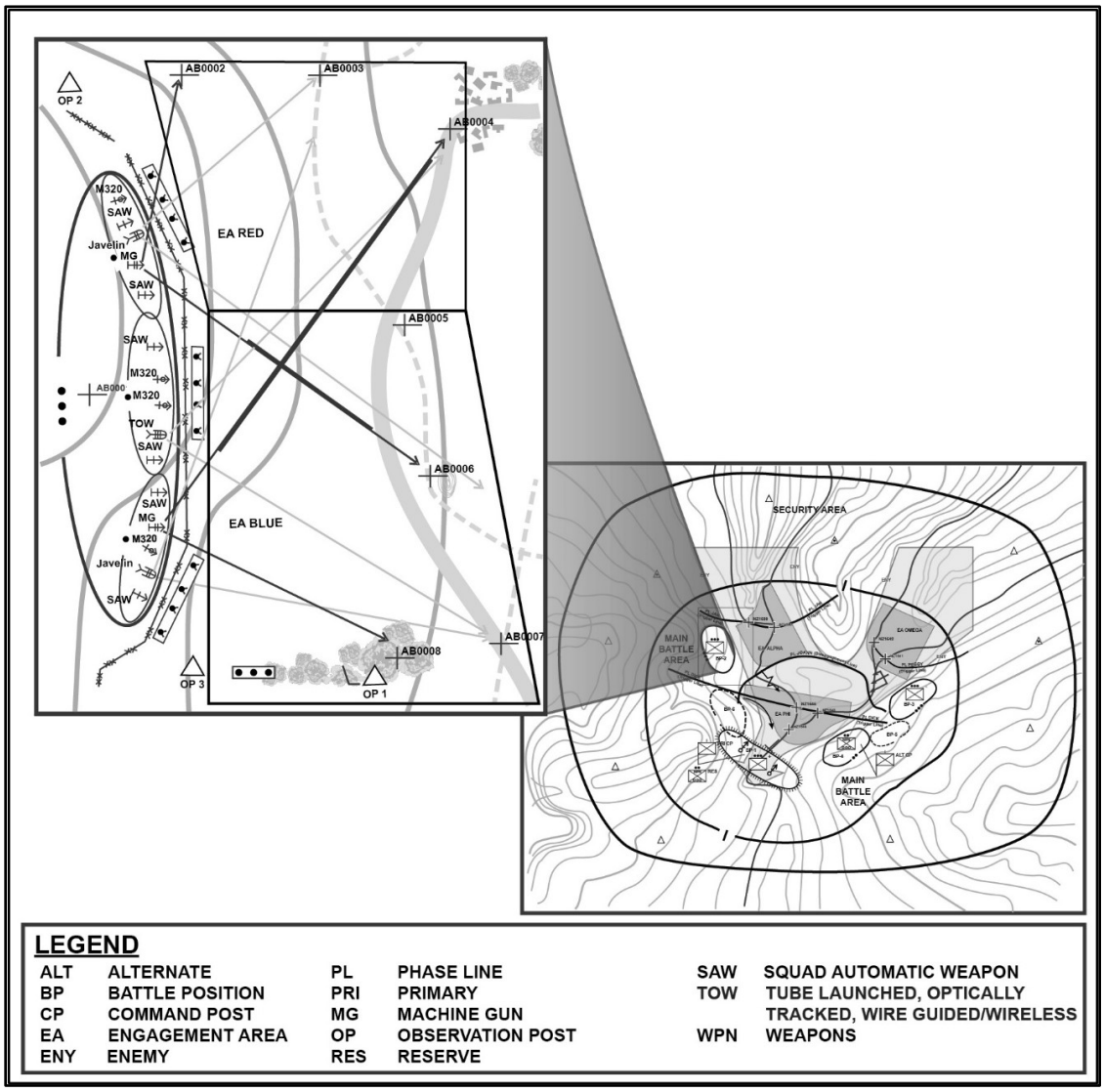


Figure 4-2. Area defense (main battle area engagements)

4-61. As the operation evolves, the commander knows that there will probably be a requirement to shift the main effort and supporting effort(s) to press the engagement and keep the enemy off balance. Throughout the area defense, all echelons must maintain a cohesive defense if it is to defeat the enemy. This does not mean, however, that the forces must be massed close together or that companies must have mutually supporting fires. With forces dispersed by the nature of maintain operations, subordinate platoons can maintain cohesion by maintaining the common operational picture, crosstalk among subordinates, and the continual tracking and reporting of the enemy. Subordinate units of the battalion and recommendations from the staff provide information allowing distributed companies to continually assess the enemy's options and movement while identifying means to defeat them. With forces widely dispersed, continual assessment of time and distance variables are essential between subordinate units. To maintain defensive cohesion, subordinate platoons keep their movement, positioning, and fires consistent with the company commander's intent, the defensive scheme of maneuver, and the obstacle plan.

4-62. Unless the battalion or other higher headquarters' plan makes other provisions (for example, a higher echelon reserve or counterattack force is responsible), the rifle company is responsible for controlling enemy

advances within its AO. When a penetration threatens the defender, commanders may take several actions to counter the situation.

4-63. In order of priority, the commander may do any or all of the following beginning with allocating priority of all available fires, to include artillery and mortar fires, Army aviation attack, and CAS, to the threatened unit. (This is the most rapid and responsive means of increasing the combat power of the threatened unit.) The commander directs or repositions adjacent units to engage enemy forces that are attacking the threatened unit. (This may not be possible if adjacent units are decisively engaged.) The commander commits the reserve to reinforce the threatened unit and to block, contain, or destroy the penetrating enemy force. Penetration of insignificant enemy forces is accepted but still maintaining contact with them as they move deeper into the main battle area. Commanders move forces to alternate, supplementary, or subsequent positions or to withdraw forces and commit attached engineers or other element to assist in containing the penetration or to constitute a new reserve.

FOLLOW THROUGH (DEFEAT IN DETAIL, CONSOLIDATE, REORGANIZE, AND TRANSITION)

4-64. The rifle company may conduct local counterattacks to restore or preserve defensive integrity. Unless the conduct of the defense has left the company largely unscathed, the company usually lacks the ability to conduct a significant counterattack by itself. If the company can organize a local counterattack force, this force must have mobility or be pre-positioned in a position of advantage or the distance or short enough to conduct dismounted movement to attack the enemy from an unexpected direction. Within the context of the battalion's operation, a defending company and its platoons may execute a local counterattack in support of the battalion's defensive posture, to stop an enemy's penetration, or to support the transition to offensive operations.

4-65. The commander and subordinate leaders plan and prepare for consolidate during troop leading procedures (TLP). Defenders eliminate remaining enemy resistance in battle positions, noncontiguous assigned areas, and the security area. They reestablish, reoccupy fighting positions and adjust unit boundaries. They reestablish local security including OPs and patrols to deny enemy direct or indirect fire on defensive positions. They continue to improve security by conducting other necessary defensive actions. These defensive actions include EA development, direct fire planning, and battle position preparation, adjust final protective fires and register targets along likely mounted and dismounted avenues of approach, secure enemy detainees, and prepares for enemy counterattack.

4-66. Reorganization usually is conducted concurrently with consolidate. It consists of actions taken to prepare the unit for follow-on tasks. As with consolidate, the defender plans and prepares for reorganization during TLP. During reorganization, defenders provide essential medical treatment and evacuate casualties, as necessary, account, treat and evacuate wounded detainees and coordinate with military police to process and transport the remainder of detainees, and reestablish key leaders using the designated succession of command. They reestablish manning of key weapons and equipment such as: FGM-148 Javelin close combat missile system (CCMS) or M3 Multi-role, Antiarmor, Antipersonnel Weapon System (MAAWS), machine guns, and grenade launchers. Simultaneously, radio telephone operators reestablish communications within the organization to higher and to adjacent units, and cross-level personnel and adjust forces as required to support operations. They conduct resupply operations, redistribute ammunition, conduct required maintenance, and continue improving defensive positions, as necessary.

4-67. At the conclusion of an engagement, the platoon may continue the defense, or if ordered, transition to the offense. The platoon leader considers the higher commander's concept of operations, friendly capabilities, and enemy situation when making this decision. All missions should include plans for exploiting success or assuming a defensive posture.

ASSESS

4-68. Assessment by the commander is continuous; it precedes and guides every operations process activity and concludes each operation or phase of an operation. The commander's assessment requires sound judgment and a thorough knowledge of the operation, characteristics of the area of interest, and the threat situation, doctrine, patterns, and projected COAs. Friendly actions, threat actions, civil considerations, and events in the area of interest interact to form a dynamic operational environment. It is critical for the company

to use well-developed procedures and flexible planning to track emerging targets and adapt to changing operational requirements during the operations process, and to meet the requirement for combat assessment.

4-69. To fight effectively, the commander and subordinate leaders must be able to understand and exploit opportunities offered by a mountainous environment and minimize its effect on operations of personnel, equipment, and weapons. The keys to meeting this challenge are proper training and operational experience in the mountains. This requires subordinate leaders to understand the need for specialized clothing, equipment, and training. The commander must recognize the importance of small-unit leaders to prevent environmental injuries and illnesses. The commander manages risk to mission and risk to Soldiers by assessing the environmental hazards daily from subordinate leaders' updates.

SECTION III – SMALL-UNIT DEFENSIVE OPERATIONS

4-70. Defensive operations conducted by Infantry small units operating in mountain environments may include an area defense, variations of the area defense, or other common defensive method or positioning within an area defense. Battle positions, an intent graphic, depicts the location and general orientation of the majority of a defending force. The three variations of an area defense (defense of a linear obstacle, perimeter defense, and reverse-slope defense) have special purposes and unique consideration associated with each. The commander may choose between two defensive methods when planning an area defense: a defense in-depth or a forward defense.

4-71. Small-unit defending forces use a variety of TTP to accomplish the mission. At one end of the defensive continuum is a static defense oriented on terrain retention. At the other end is a dynamic defense focused on the enemy. The commander combines static actions (see figure 4-1 on page 63) to control, stop, or canalize the attacking enemy forces and dynamic actions (see figure 4-2 on page 65) to cover gaps between defensive positions, reinforce those positions as necessary, and counterattack to seal penetrations or to block enemy attempts at flanking movements. (See ATP 3-21.10 and ATP 3-21.8 for basic doctrine to conduct defensive ground combat operations.)

AREA DEFENSE

4-72. When the situation dictates a dispersion of units in mountain environments, the planning for a 360-degree defense is often required for most positions occupied within an area defense. Infantry companies and platoons conducting mountain operations are often directed to conduct this type of defense around established positions such as a base camp (see ATP 3-21.20 for information on base operations) or a key piece of terrain. The dominating hills, ridges, and peaks of mountain terrain are ideally suited for this defensive task. Units occupying strong points (see figure 4-1 on page 63 and paragraph 4-87) located on dominating heights can defend their own position and help control passes and lines of communication in surrounding areas.

4-73. In planning an area defense (see figure 4-3 on page 68) in mountain environments, company commanders and platoon leaders consider the characteristics of the defense along with the specific defensive subordinate form and maneuver they plan to use. While other defensive operations (see paragraph 4-2) are possible in mountain environments, the terrain at higher levels often limits their use due to mobility restrictions and the complicated terrain.

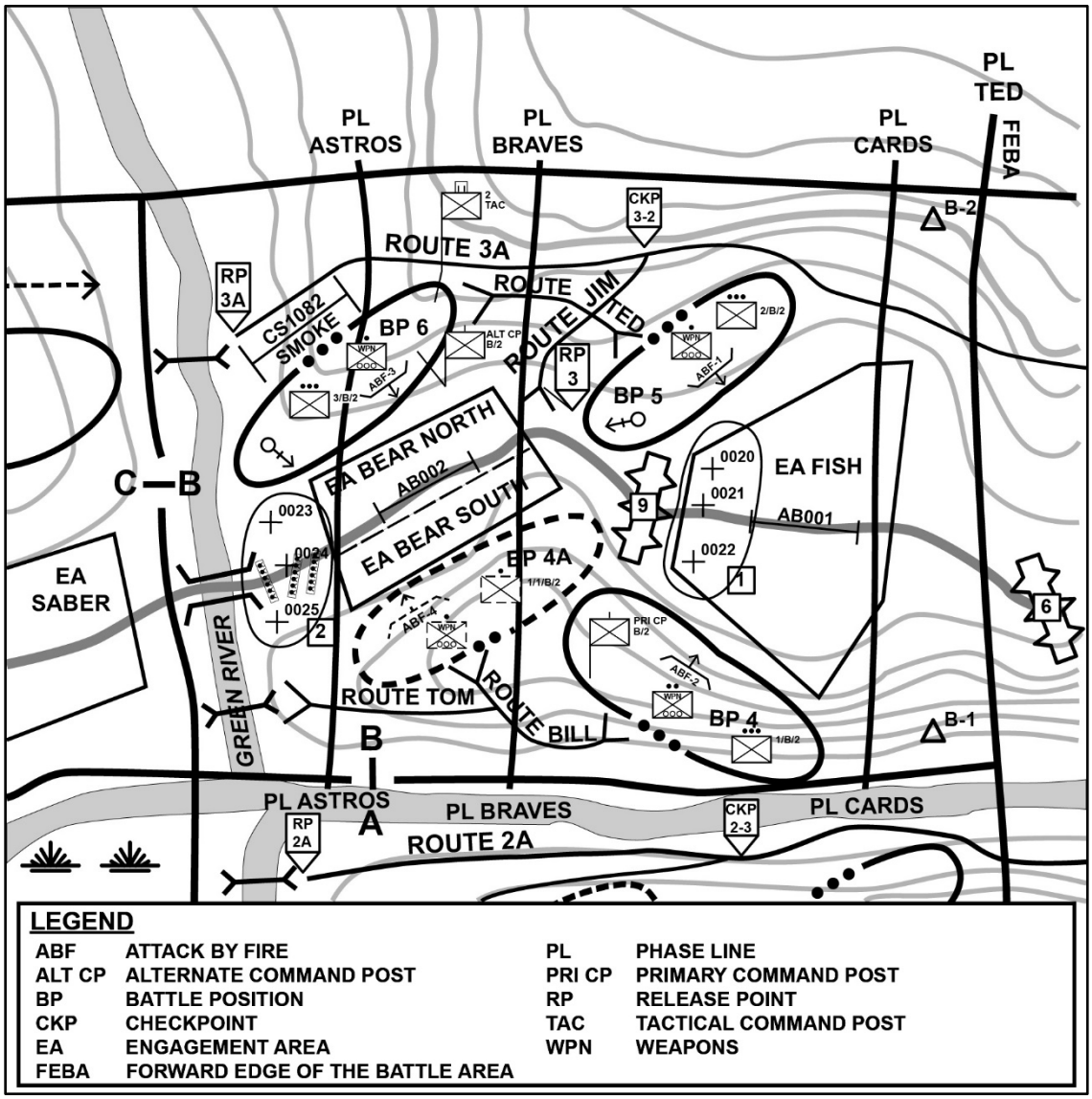


Figure 4-3. Area defense (platoon battle positions in-depth)

4-74. In mountainous environments, companies and platoons often operate out of established positions or bases, such as combat outposts, and conduct defensive or security operations in the areas of these bases. Attacks on these positions may be a direct assault, come in the form of indirect fire, or a combination of both. Enemy engagements may be short and their fires inaccurate depending on the weapons used, their skill, and the time involved in the attack. Enemy tactics in mountain environments may include an attack from a distance from covertly set up direct and indirect assets such as machine guns, rockets, and mortars.

4-75. Within an area defense, a commander conducts supporting efforts (for example, mortar and artillery fires) designed to regain the initiative by limiting the attacker's options and disrupting the enemy's plan. Supporting efforts prevent enemy forces from massing and create windows of opportunity for the conduct of decisive maneuver, allowing the defending force to defeat the attacking enemy in detail. The commander's mission analysis determines how closely supporting efforts are synchronized with the main effort. Reconnaissance and surveillance (R&S) missions and security operations are normally components of supporting efforts within security areas and main battle areas.

BATTLE POSITIONS

4-76. A *battle position* is a defensive location oriented on a likely enemy avenue of approach (ADP 3-90). The battle position is an intent graphic that depicts the location and general orientation of the majority of the defending forces. The commander's use of a battle position does not direct the position of the subordinate's entire force within its bounds since it is not an AO. Subordinate leaders can move elements freely within assigned battle positions. To comply with the commander's intent, a defending force can maneuver outside the battle position to adjust fires or to seize opportunities for offensive action. Repositioning of units between battle positions must be carefully coordinated to prevent fratricide.

4-77. When the company is participating in a battalion area defense the battalion commander defines when and under what conditions the company can displace from the battle position or maneuver outside of the battle position. The company commander does the same for subordinate platoons, issuing and adjusting changes and updates continuously addressing guidance for combat patrols; raids, ambushes, and security patrols and reconnaissance patrols being conducted while the company conducts the defense. (See ATP 3-21.8, chapter 7 for more information.) The company commander also ensures platoons understand the conditions to reposition, and displacement criteria planning considerations for a battle position. Although not all inclusive, criteria may include—

- Establishment of outposts and OPs forward of battle positions.
- Combat patrol plan and routes forward of battle positions.
- Activities in the company security area.
- All-around security and the utilization of mines.
- Development of integrated fires plans that include final protective fires.
- Priorities of work.
- Counterattack plans.
- Stockage of supplies.
- Integration and support of subordinate forces outside the strong point.
- Actions of adjacent units.
- Fire control measures in support of the battle position.
- Obstacles and battle position emplacement and orientation.

4-78. The commander also takes into consideration the positioning of the company headquarters personnel and equipment. These personnel are likely comprised of the commander, XO, 1SG, radiotelephone operators, fire support officer, fire support NCO, and mortars. The commander positions at the location where to best control all forces in concert with one another. The company command post (CP) and mortar firing point(s) centrally locate, within the area defense, or battle position. This allows for the most control of subordinate, attached, and supporting forces without being decisively engaged as the enemy approaches the EAs. When positioning the CP and forces, the commander ensures there is enough space allocated between the EAs and the CP and other elements to afford forward platoons' ample space to reposition, if necessary, as the engagement begins. The CPs should be in a defilade and covered and concealed from air and ground observation and fires. The route to and from the CPs should be adequately covered and concealed. It is important for the commander to identify and prepare an alternate CP if the primary CP needs to be relocated during the engagement.

4-79. The three levels of preparation for a battle position are occupy, prepare, and plan. Occupy is the complete preparation of the position where subordinate units initially defend. Units fully plan, prepare, and occupy positions before they defend no later than time specified in the operation order. Companies and platoons rehearse the occupation, and company commanders establish triggers for occupation of positions. Units occupying a battle position, despite time constraints, dig in survivability positions, construct fighting positions, designate target reference points, develop direct and indirect fire plans, emplace obstacles, clear fields of fire, and pre-stock ammunition.

4-80. In mountainous environments, the space available and terrain are key factors to consider as the commander allocates space to elements within the area defense and individual subordinate unit battle positions. The commander thinks at a minimum two levels down, but considers the mutual support, and siting of obstacles from all battle positions within the company AO to ensure the most effective defense. When practical, the commander should allow enough space on each battle position for dispersed primary, alternate,

and supplementary positions for key weapons. The commander can vary the number of maneuver elements in the battle position by allocating larger platoon battle positions. Battle positions can also reflect positions in-depth. They may take a shape other than the standard oblong shape, which suggests a linear defense within the battle position. When possible, the commander designates large battle positions to increase dispersion to counter enemy fires. The commander can combine company AO and battle positions in the battalion AO to suit the tactical situation.

4-81. The five types of battle positions are primary, alternate, supplementary, subsequent, and strong point. The commander always designates the primary battle position (see figure 4-4). Subordinate leaders (company level) designate and prepare alternate, supplementary, and subsequent positions as time and other resources permit, and if the terrain or situation permits and requires them.

PRIMARY POSITION

4-82. A *primary position* is the position that covers the enemy's most likely avenue of approach into the assigned area (FM 3-90). A primary position is the best position to accomplish the assigned mission. Routes between positions should be well-known and rehearsed (optimally under the same conditions expected during execution).

ALTERNATE POSITION

4-83. An *alternate position* is a defensive position that the commander assigns to a unit or weapon system for occupation when the primary position becomes untenable or unsuitable for carrying out the assigned task (FM 3-90). The alternate position covers the same area as the primary position. These positions allow the defender to carry out original task, such as covering an avenue of approach or EA, using the original direct fire plan. Alternate positions increase the defender's survivability by allowing engagement of the enemy from multiple positions and movement to other positions in case of suppressive or obscuring fires.

SUPPLEMENTARY POSITION

4-84. A *supplementary position* is a defensive position located within a unit's assigned area that provides the best sectors of fire and defensive terrain along an avenue of approach that is not the primary avenue where the enemy is expected to attack (FM 3-90). A supplementary position is assigned when more than one avenue of approach exists into a unit's AO.

SUBSEQUENT POSITION

4-85. A *subsequent position* is a position that a unit expects to move to during the course of battle (FM 3-90). The defending unit may have a series of subsequent positions (particularly in delay operations), each with associated primary, alternate, and supplementary positions.

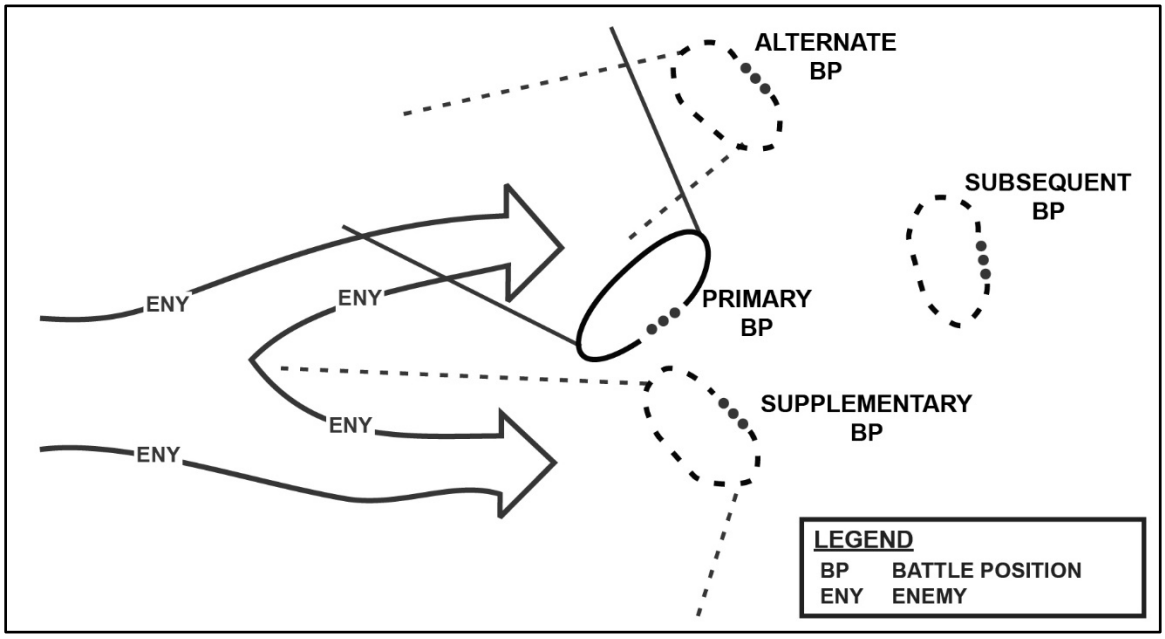


Figure 4-4. Primary, alternate, supplementary, and subsequent battle positions

STRONG POINT

4-86. A *strong point* is a heavily fortified battle position tied to a natural or reinforcing obstacle to create an anchor for the defense or to deny the enemy decisive or key terrain (ADP 3-90). A strong point implies retention of terrain to control key terrain and blocking, fixing, or canalizing enemy forces. Before assigning a strong point mission, the commander ensures that the strong point force has sufficient time and resources to construct the position, which requires significant engineer support. Defending units require permission from the higher headquarters to withdraw from a strong point. Once the strong point is occupied, all units and equipment not essential to the defense are displaced from the strong point. All combat, maneuver enhancement, and sustainment assets within the strong point require fortified positions. Extensive protective and tactical obstacles are required to provide an all-around defense. (See battle position 1 in figure 4-1 on page 63.)

4-87. Strong point positions in mountain terrain are characterized by the emplacement of direct fire weapons for all-around protection. While a series of strong points can provide an effective defense for a specified area, a contiguous defense in mountain terrain is not generally possible due to terrain restrictions and manpower constraints. In mountain environments, reserve forces should be close to defensive locations to offset terrain restrictions that can delay reaction times. Air support and indirect fire assets are typically integrated into the defensive plan. Around-the-clock observation, along with patrols and electronic sensors, are commonly required to counter the unique opportunities mountain terrain offers for enemy infiltration.

4-88. In mountain environments, companies are often directed to construct a strong point. To do so, companies generally augment with engineer support, additional weapons, and sustainment resources. If attacked, Soldiers defend a strong point until the commander directing the defense formally orders the unit out of it. The specific positioning of units in the strong point depends on the company commander's mission analysis.

STRONG POINT DEFENSE CONSIDERATIONS

4-89. In preparing a strong point defense, the same considerations for a perimeter defense apply. Other considerations include reinforcing each individual fighting position (to include alternate and supplementary positions) to withstand small-arms fire, mortar fire, and artillery fragmentation; stockpiling in each fighting position, food, water, ammunition, pioneer tools, and medical supplies in each fighting position.

4-90. Each individual fighting position should be supported by several others. Covered and concealed routes should be planned or constructed between positions and along routes of supply and communication. These routes can be used to support counterattacks and maneuver within the strong point.

4-91. The strong point should be divided into several independent, but mutually supporting, positions or sectors. If one of the positions or sectors must be evacuated or is overrun, limit the enemy penetration with obstacles and fires, and support a counterattack. Obstacles and minefields should be constructed to disrupt and canalize enemy formations, to reinforce fires, and to protect the strong point from the assault. These obstacles and mines should be placed as far out as far as friendly units can observe them, within the strong point, and at points in between where they are useful.

4-92. Primary and alternate LZs should be identified for the movement of personnel and supplies when necessary. The primary LZ should be within the strong point itself with the alternate nearby and procedures for obtaining quick access through friendly constructed obstacles to the LZ.

4-93. Standard range cards should be prepared for each position and confirm them by fires. Indirect fires should be planned in detail and registered. Also, indirect fires should be planned for firing directly on the strong point using proximity fuzes.

4-94. Several means of communication should be planned and tested within the strong point and to higher headquarters. Possibilities include radio, wire, messenger, pyrotechnics, and other signals.

4-95. The strong point should be improved or repaired until the unit is relieved or withdrawn. More positions can be built, tunnels and trenches dug, existing positions improved or repaired, and barriers built or fixed.

4-96. Strong points might be part of any defensive plan and are commonly established to protect vital unit operational areas, bases, and key terrain. In mountain environments, strong points may be molded to the terrain by integrating natural camouflage and obstacles. Existing natural obstacles found in mountain terrain can support formidable strong points (see figure 4-5).

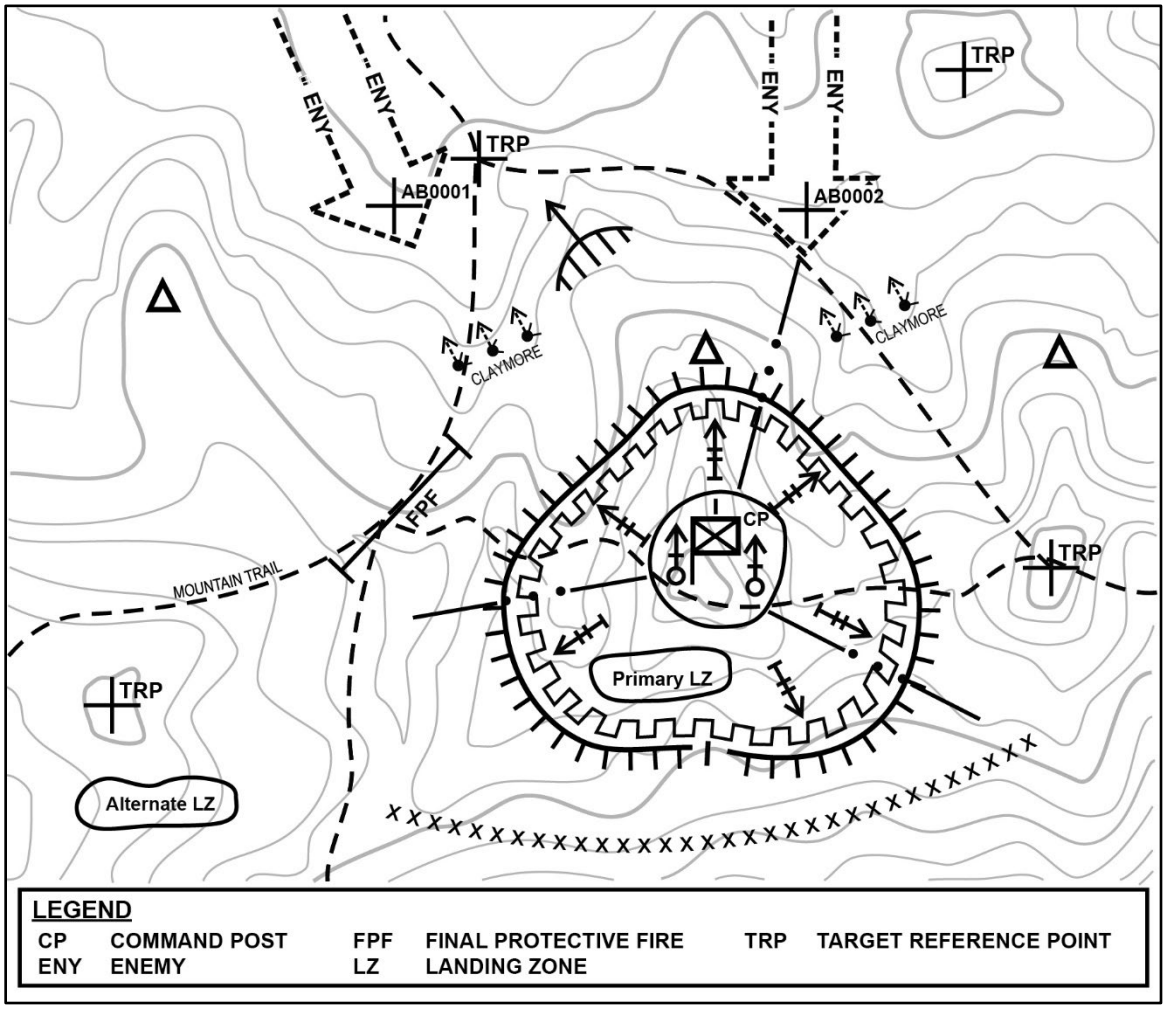


Figure 4-5. Strong point battle position

4-97. A strong point defense is commonly set up to support a company combat outpost in mountain environments. A combat outpost is a defensive position that supports internal and external operations and should provide the ability to secure itself. As with other defensive positions, the challenge is to retain the initiative during an enemy attack in order to keep the enemy reacting and unable to execute their own plan. In preparation for the defense of a combat outpost, security measures should be made strong enough to halt an attack by a force significantly larger than the defending force. (See chapter 5 for more information on combat outposts.)

4-98. To reduce the risks and effects of an enemy attack, defensive plans should aim to keep the enemy ground forces as far away from the position as possible. Maximum standoff should be a consideration when leaders are deciding where to locate a strong point. Security patrols may also be used to assist in covering dead space and other unobservable areas. Security patrols seek to make contact with enemy elements to disrupt their operations and keep them from forming effective offensive operations against the friendly position. (See chapter 5 of this manual for more on patrolling operations.)

DEFENSE OF A LINEAR OBSTACLE

4-99. The defense of a linear obstacle is similar to a forward defense with the intent being to limit the terrain over which the enemy can gain influence or control. When defending a larger AO, a linear obstacle adds to the strength of the defense and can be a river, a stream with steep embankments, or a man-made obstacle such as a highway or embankment. In mountainous terrain, the key to success in a defense of a linear obstacle is maintaining the integrity of the defense by preventing the enemy from securing a foothold on the friendly

side of the obstacle. When the enemy gains and maintains a foothold, the defending unit must contain it and prevent its expansion. The defending commander, if the terrain allows, should have a plan to conduct a delay if the enemy gains sufficient strength to attack out of the bridgehead. Defending units integrate additional man-made obstacles to natural obstacles to stop enemy forces, channel them into planned EAs, and to further enable the integrity of the linear obstacle. The defense of a linear obstacle usually forces the enemy to deploy, concentrate forces, and conduct breaching operations. When attacked, the defending force isolates the enemy, conducts counterattacks, and delivers fires onto the concentrated force to defeat attempts to breach the obstacle.

4-100. During planning, the commander uses intelligence products to identify probable enemy objectives and approaches. From those probable objectives and approaches, named areas of interest and targeted areas of interest are developed. The commander considers the mission variables of METT-TC (I) to determine how best to concentrate efforts and economize forces. A detailed terrain analysis is most likely the most important process that the commander completes. A successful defense relies on a complete understanding of terrain to determine likely enemy COAs and the best positioning of company assets to counter them.

4-101. During preparation, the commander monitors subordinate actions and tracks higher and adjacent unit situations and the enemy situation. The commander updates and refines plans based on additional reconnaissance and updated intelligence products. The commander continues to disseminate modifications and adjustments through fragmentary orders and conducts much of the preparation phase simultaneously with security operations, continuing even as forces gain contact with the enemy. Throughout the preparation phase, the company commander and all subordinate leaders physically inspect preparatory activities to update weapons positioning, setting of obstacles, direct and indirect fire plans and associated triggers, sustainment operations, and battle positions and Soldier knowledge of their missions are all critical checks. The preparations conducted are captured utilizing sector sketches that identify all improvements made to the defensive plan and illustrate a common operational picture across the formation. Subordinate platoons develop two sets of their sector sketch, one for them to retain and the other provided to the company. The company sketch is typically prepared by the commander, with the assistance of CP personnel, and updated throughout preparation and as the plan develops.

4-102. During execution, the defense of a linear obstacle often entails relatively long frontages (see figure 4-6). Based on the mission and the frontage assigned the commander positions units that mutually support each other throughout the length and depth of the defense. Mutual support exists when positions and units support each other by direct and indirect fires to prevent the enemy from attacking one position without being subject to fire from one or more adjacent positions. Mutual support increases the strength of all defensive positions, prevents defeat in detail, and helps prevent infiltration between positions. In mountainous terrain and in cold weather regions this is often not possible. In this situation, the commander relies on other activities, such as surveillance and security patrols, to prevent these enemy actions.

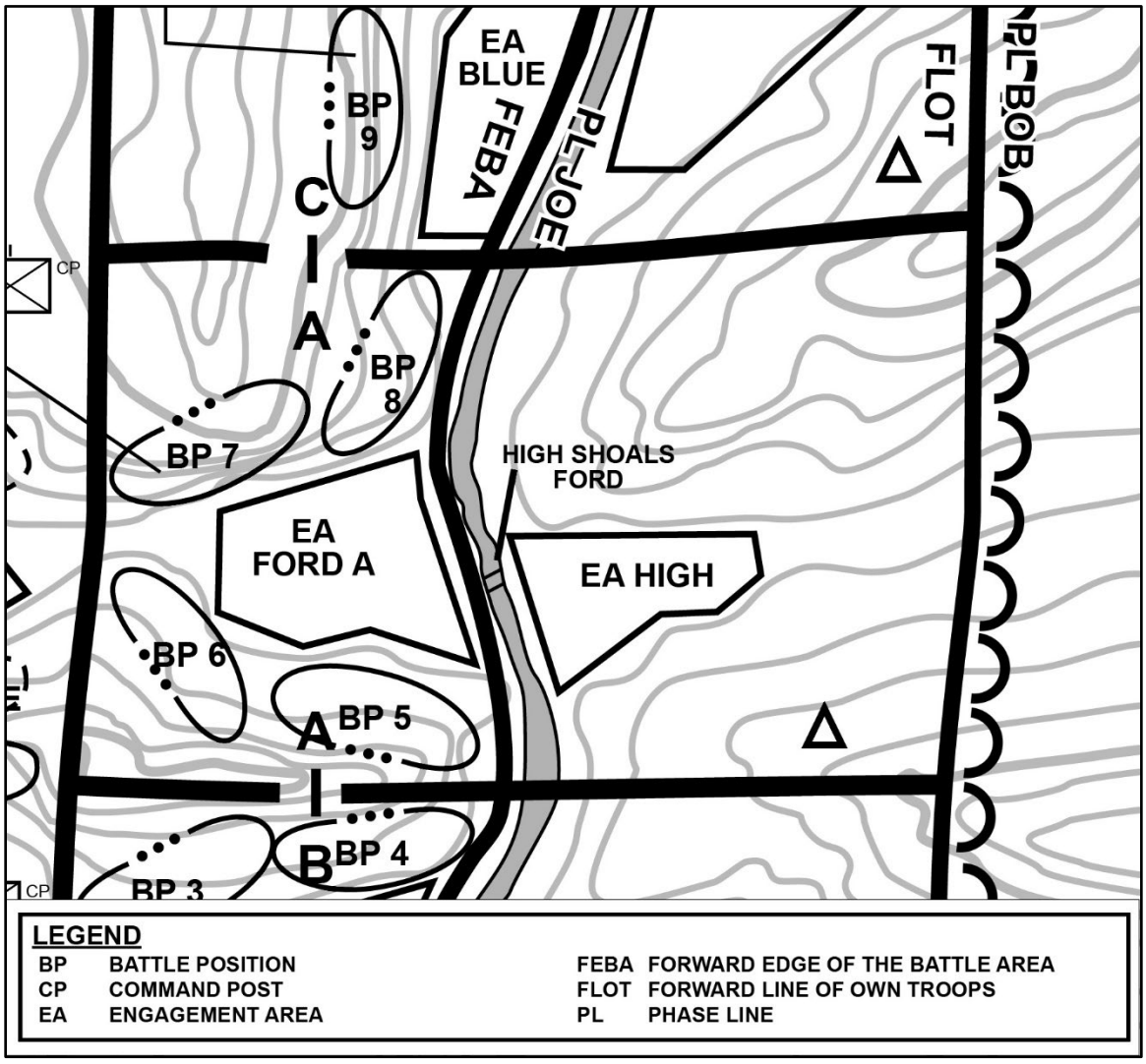


Figure 4-6. Defense of a linear obstacle

PERIMETER DEFENSE

4-103. A perimeter defense is a defense oriented in all directions. A perimeter defense by design has a secure inner area with most of the combat power located on the perimeter. Perimeters vary in shape depending on the terrain and situation with the perimeter shape conforming to the terrain features that best use friendly observation and fields of fire. The commander in a perimeter defense designates the trace of the perimeter, battle positions, contact points, and lateral and forward boundaries. When the commander determines the most probable direction of enemy attack, that part of the perimeter covering that approach may be reinforced with additional resources. Once the threat is determined and from which direction resources such as medium and heavy machine guns and CCMS (or MAAWS) teams are emplaced along these identified avenues of approach. The commander employs patrols, raids, ambushes, and fires in security areas to harass and destroy enemy forces before they make contact with the perimeter. The commander increases the effectiveness of the perimeter by tying it into a natural obstacle, such as a river and restrictive terrain not easy trafficable. This allows the defending unit to concentrate its combat power in more threatened areas. Normally, when the commander designates a reserve, it is centrally located to react to any point of penetration along the company's perimeter.

4-104. An Infantry company conducting operations in mountain environments may be required to execute a perimeter defense under a variety of conditions including—

- When it must hold critical terrain in areas where the defense is not tied in with adjacent units.
- When it has been bypassed and isolated by the enemy and must defend in place.
- When it conducts occupation of an independent assembly area or reserve position.
- When it begins preparation of a strong point.
- When it is directed to concentrate fires into two or more adjacent avenues of approach.

4-105. The Infantry company centrally prepares a perimeter defense (see figure 4-7) when there are no friendly units adjacent to it. Considerations for preparing a perimeter defense include—

- Planning for all round security and defense in all directions.
- Planning coverage of the most likely avenues of approach.
- Planning alternate and supplementary positions within the perimeter.
- Planning the placement of CCMS (or MAAWS) teams on possible mounted avenues of approach and snipers to observe or overwatch key areas.
- Planning mortar positions near the center of the perimeter so their minimum range does not restrict the ability to fire in any direction.
- Planning for dug in and covered ammunition storage bunkers.
- Planning a reserve of one or more rifle squads in reserve with primary positions near the most dangerous avenue of approach and supplementary positions for fighting in all directions.
- Planning use of obstacles in-depth around the perimeter.
- Planning the integration of direct fires, indirect fires, and aviation assets.
- Planning sustainment solutions for an extended perimeter defense including the use of air movements and LZs for resupply and evacuation of wounded.

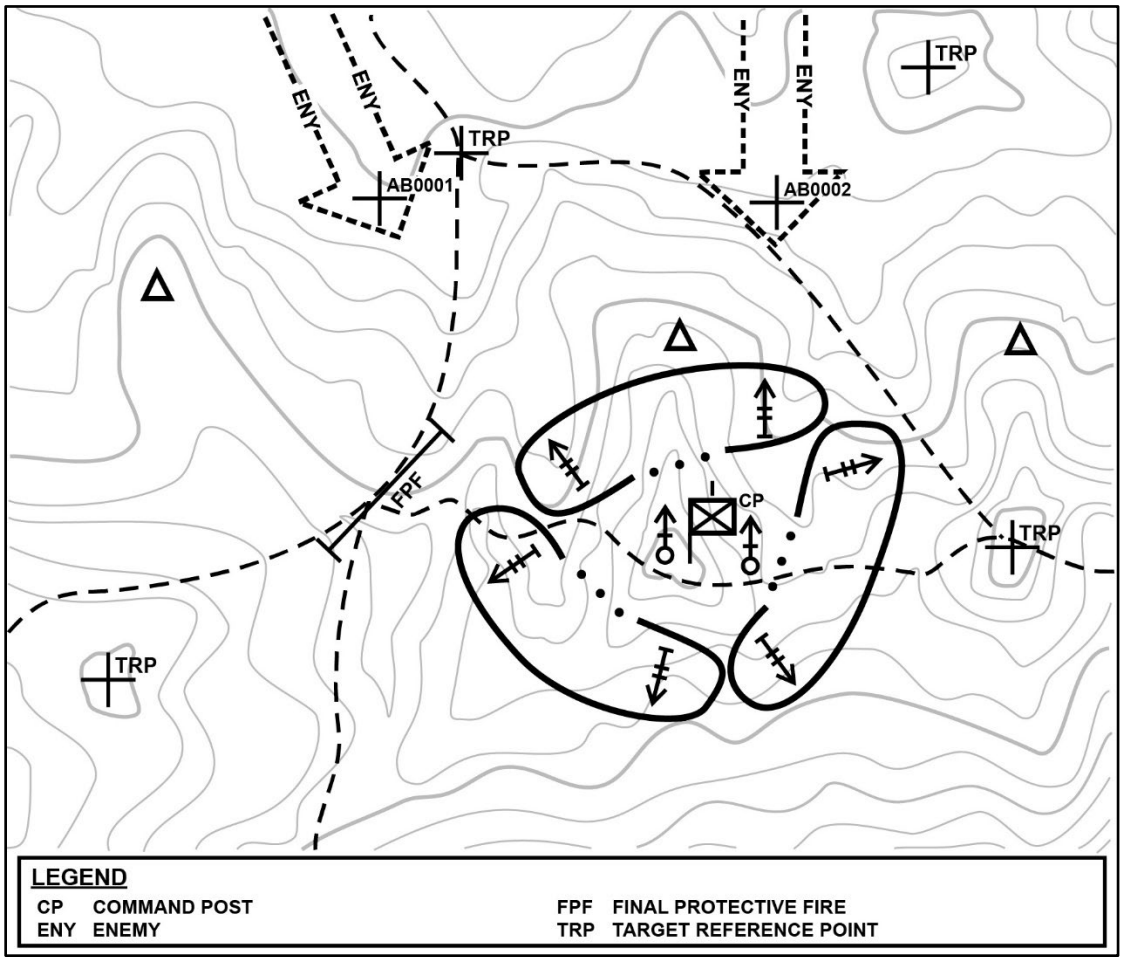


Figure 4-7. Perimeter defense

REVERSE-SLOPE DEFENSE

4-106. An alternative to defending on the forward slope of a hill or a ridge is to defend on a reverse-slope. Infantry small-unit mountain operations may provide opportunities for conducting a reverse-slope defense. In a reverse-slope defense, the defending unit is deployed on terrain that is masked from long-range enemy direct fire and ground observation by the crest of a hill. Although some units and weapons might be positioned on the forward slope, the crest, or the counterslope (a forward slope of a hill to the rear of a reverse-slope), most forces are on the reverse-slope. (See figure 4-8 on page 78.)

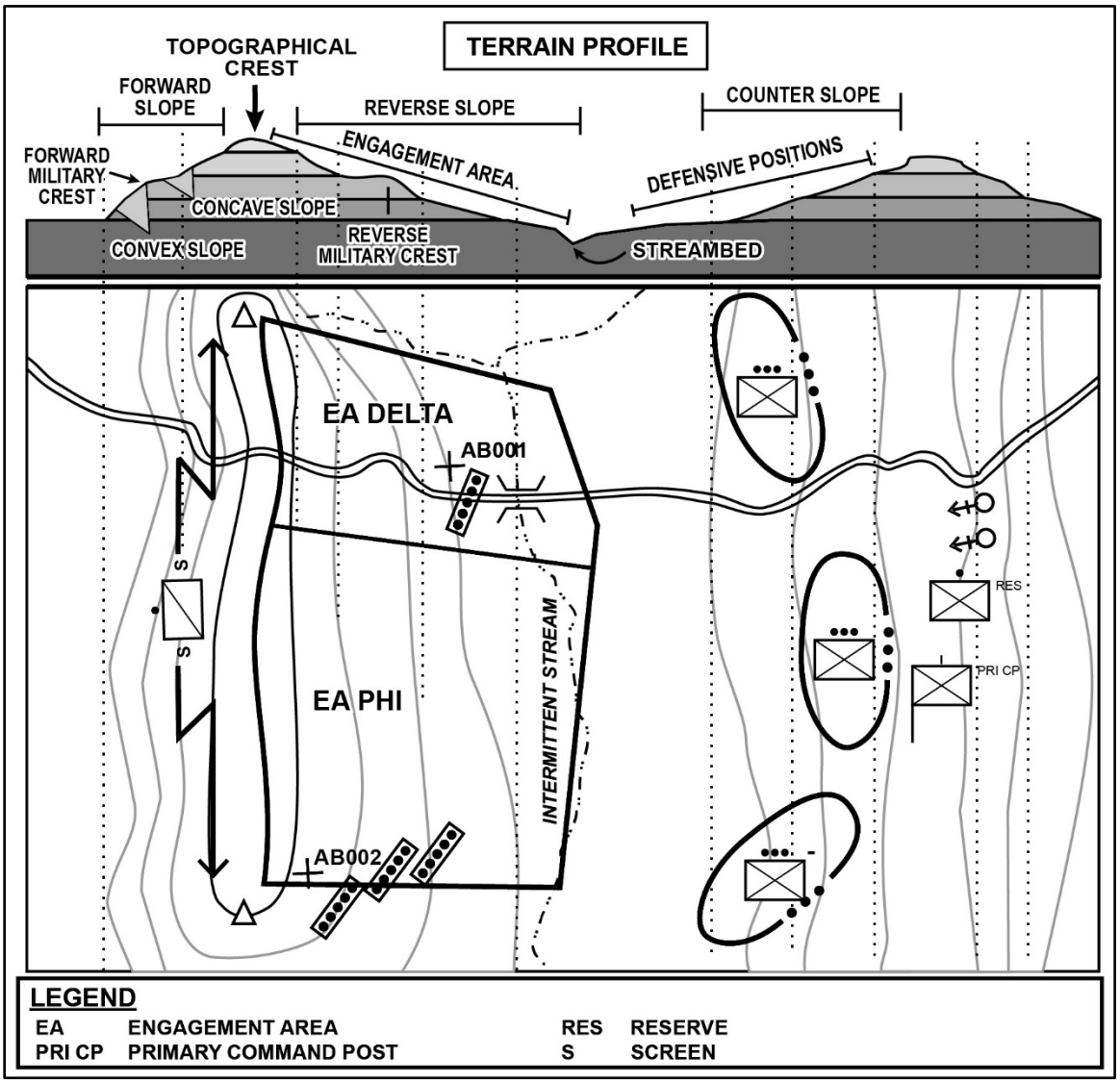


Figure 4-8. Reverse-slope defense

4-107. The key to the reverse-slope defense is control of the crest of the hill. The intent is to draw the enemy onto the crest of the hill where they can be engaged with direct fire. Enemy forces that have not yet reached the crest of the hill are not able to effectively engage in the battle. This technique allows a smaller friendly force to defend effectively against a larger enemy force by limiting the number of enemy personnel that can engage at any given time.

4-108. Advantages for using a reverse-slope defense, when possible, include the following:

- Protection from long-range enemy direct fire.
- Reduced enemy observation affects their ability to adjust indirect fire.
- Reduced ability for additional enemy units to support their assault.
- Deception may cause the enemy to advance to close contact before they discover the defensive position.
- Obstacles and clear fields of fire can be emplaced without disclosing friendly positions.
- Enemy target acquisition and jamming efforts are degraded.
- Enemy aircraft must attack from the flank or from the rear.
- Counterattacking forces have greater freedom of maneuver.

4-109. Considerations for preparing a reverse-slope defense include—

- Positioning OPs forward of the crest to provide early warning and long-range observation and fires.
- Planning egress routes from the reverse-slope to alternate or subsequent positions.

This page intentionally left blank.

Chapter 5
Tactical Enabling Operations and Activities

As in all operations, Infantry small units conduct a variety of tactical enabling operations and activities in support of offensive and defensive operations and operations in support of stability. Specific to mountainous and cold weather regions, this chapter addresses tactical movement, establishment of observation posts (OPs) and combat outposts, tunnel and cave operations, and base camp operations. It addresses these operations and activities along with considerations for dismounted movements and Soldier load to help establish conditions for the accomplishment of critical tasks during mountain and cold weather operations.

SECTION I – SMALL-UNIT MOVEMENT, EMPLOYMENT, AND MANEUVER

5-1. The upper levels of mountain terrain commonly consist of barren rocky slopes sparsely sprinkled with trees and stunted bushes. Rock formations can be steep, craggy, jagged, and unforgiving. High altitude, rocky terrain with varying degrees of constantly changing slopes is an obstacle that must be continually negotiated while conducting operations in mountain environments. When planning routes, commanders should factor elevation gain and loss, as much as distance, into their movement timelines as effects of slope on dismounted movement is significant. Mountain peaks may have little or no vegetation and can be permanently snow covered. Further, down mountain slopes vegetation commonly becomes thicker while washes, streams, rocks, and changing terrain features can remain significant obstacles. Movement, employment, and maneuver are difficult at best in these conditions.

TACTICAL MOVEMENT

5-2. *Tactical movement* is a movement in which troops and vehicles are arranged to protect combat forces during movement when a threat of enemy interference is possible (FM 3-90). In most cases, mountain terrain severely limits mounted, and often dismounted, movement to roads and trails. The local populace and animals often create a series of trails that crisscross the mountain terrain. In many cases, ground travel to the top of a mountain requires the use of these trails for at least part of the ascent. Trails typically follow contour lines with multiple switchbacks. A straight-line distance from point to point may be relatively short while actual trail distance may be lengthy. Movements are often confined to file type formations with the trails and dry streambeds becoming likely avenues of approach. There are three methods of a tactical movement that units of all types can conduct: approach march, forced march, and tactical road march. (See ATP 3-21.18 for a detailed discussion of each method.)

DISMOUNTED MOVEMENT

5-3. Dismounted movements increase the commander's maneuver options. Their positive characteristics include combat readiness (all Soldiers can immediately respond to enemy attack without the need to dismount), ease of control, adaptability to terrain, and independence from the existing road network. Their limitations include a slow movement rate and increased personnel fatigue. Soldiers carrying heavy loads over long distances or large changes in elevation get tired. Infantry small units conduct dismounted movements when the situation requires stealth, the distance to travel is short, transport or fuel is limited, or the situation or terrain precludes using many vehicles.

General Planning Considerations

5-4. Planning dismounted movements in mountain environments includes considerations for time increases traversing rough mountain terrain and challenging movement between natural corridors and compartments. Movement through depressions and gullies can create conditions for an enemy ambush.

5-5. Precipitation that impacts planned mobility includes dirt mountain roads without culverts or other protections against erosion that become badly damaged with ruts becoming permanent fixtures as they dry. Mountain water runoff washes away portions of roads and trails making it impassable for vehicular traffic

and roads that tend to shift over time as local personnel find routes around these washes. Rainstorms from miles away that cause a sudden flood in a dry streambed used for planned movement can make travel impossible. Sudden flooding that occurs in larger mountain and valley streams that are fed by mountain water runoff, streams, and springs. Rope systems and other specialized equipment or training that may be required to assist in mountain stream crossings or in moving up or down steep inclines.

5-6. Both a help and hindrance, snow conditions can aid travel by covering rough terrain with a consistent surface while deep snow can impede movement. Avalanches may block a planned route and remain a risk for movement in or near potential avalanche areas. Resourcing snowshoes, skis, and over-snow vehicles may be required and movement across glaciers requires special training and equipment.

Effects on Dismounted Movement

5-7. Different types of rock and varying degrees of slope greatly affect dismounted movement and present unique hazards. Dismounted movements should be calculated, deliberate operations. Constantly changing slopes slow foot movements and tire personnel. Distances that normally take an hour or two in flat terrain may take all day to traverse. High altitude effects on personnel further compound energy issues and decrease the efficiency of dismounted movements. Due to the inaccessibility of vehicles, personnel on foot are often required to carry heavy loads of personal and combat equipment, creating additional stress and further slowing dismounted movements.

5-8. Moving in hazardous mountain terrain, especially during limited visibility conditions, can easily contribute to personnel casualties even in the absence of enemy forces. A 1-meter ledge rapidly traversed in daylight presents a significant challenge or obstacle at night or during other limited visibility conditions. Ambient light available for use in the mountains most often comes from natural sources such as the moon and stars. Usually, there is no light available from man-made sources. Without natural ambient light, depth perception with the naked eye suffers. Night vision goggles can help when some ambient light is available but they too can distort depth perception creating an additional hazard. Rapid movement under these conditions can be difficult.

5-9. Dismounted movements in mountain terrain are tough physically and mentally but are often required for levels II and III movements (see paragraphs 1-29 and 1-30). Movements are often slow, deliberate, and exhausting. Commanders should allow for ample Soldier rest and recovery time between tiring difficult movements through mountain terrain and follow-on mission objectives. Soldier strength can be saved by transporting units as far as possible by vehicles or other transportation assets before beginning a dismounted portion of an operation. Leaders should monitor Soldier fatigue to ensure carelessness does not result in noncombat related injuries.

MOUNTED MOVEMENT

5-10. Mounted movement involves the movement of troops and equipment by combat and tactical vehicles. The speed of the movement and the increased amounts of supplies that can accompany the unit characterize this movement method. Armored and Stryker maneuver units are normally self-sufficient to conduct mounted movements over short distances. Small-unit Infantry units and most functional and multifunctional support and sustainment units are not 100-percent mobile with organic truck assets and need assistance from transportation elements to conduct mounted movements.

General Planning Considerations

5-11. During movement planning, key points to consider for mounted movements include—

- Establishment of an overwatching element during movement.
- Transportation of units as far as possible by vehicle, until dismounted operations are required to help conserve Soldier strength and energy.
- Dismounted troops interspaced with the vehicles to provide security and route clearance.
- Vehicles carrying only drivers, gunners, and supplies while others walk to provide security and overwatch.
- Plans for extended movement times.
- Dismounted troops bound forward to establish overwatch positions or clear dead space before vehicles proceed.
- Ground guides for driving in steep or difficult mountain terrain.
- Reduction of tire pressure to increase traction and performance.
- Driver knowledge of techniques for using brake or throttle modulation and use of the transmission to assist in braking in steep and broken terrain.

5-12. Considerations for mounted movements over extended distances include—

- The ability of the route network to support the numbers, sizes, and weights of the tactical and combat vehicles assigned to or supporting the unit making the move.
- Available refueling and maintenance sites and crew-rest areas.
- The need for recovery and evacuation assets.
- Available spill kits, personal protective equipment, and spill cleanup waste disposal equipment.

Effects on Mounted Movement

5-13. In mountain environments, there is often a primitive, degraded, or canalizing road network. Constructed roads may be in a state of disrepair making vehicle traffic difficult (see figure 5-1 on page 84). Roads may consist of pothole-riddled dirt trails barely wide enough for vehicles to pass while some of the larger, more improved heavily traveled roads and road networks may be damaged from either old or recent military activity. Previously damaged or destroyed bridges may have been repaired while others remain broken. Trafficable roads in these environments may be few.

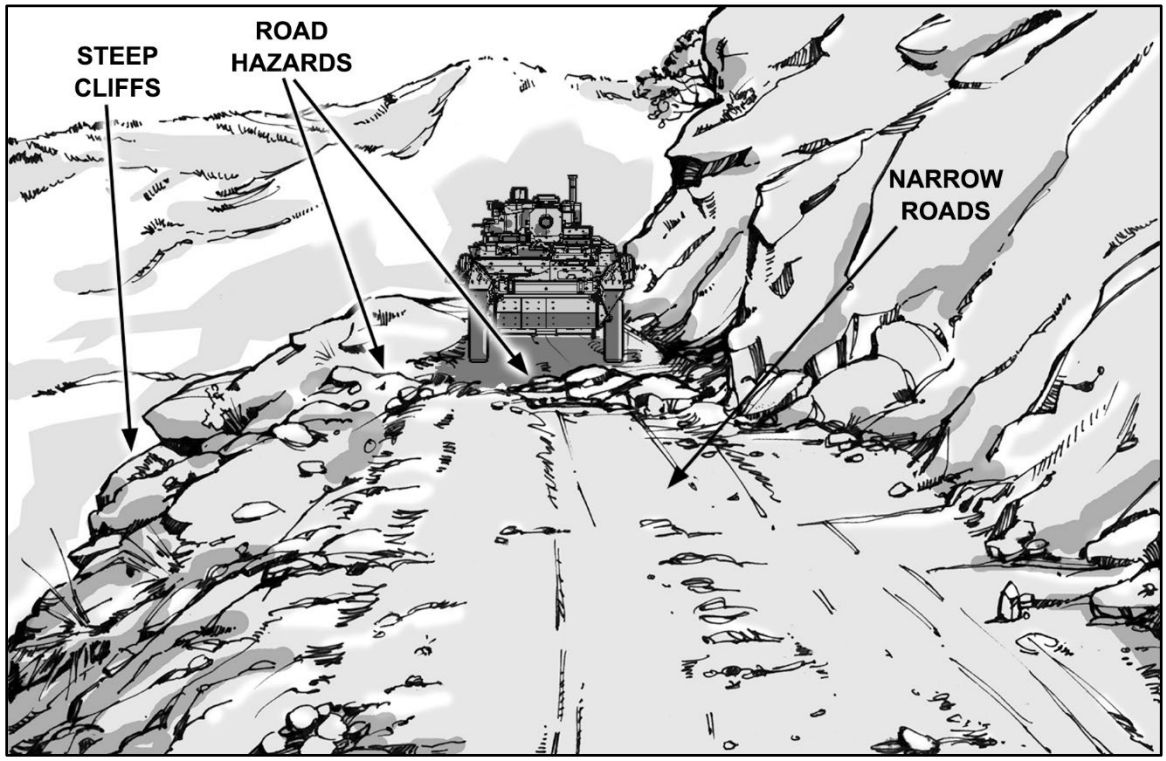


Figure 5-1. Mountain road (mounted movement)

5-14. As mountain slopes begin to rise, the ability to maneuver vehicles decreases. Mountain terrain often limits tactical movement by vehicles to a file that is almost exclusively restricted to improved or unimproved roads. Additional vehicle formations and maneuver is more easily accomplished near the base of a mountain. During movement planning, commanders should consider the risks of being confined to a vehicle, in a file, on roads used for vehicular traffic.

5-15. The potential for an enemy ambush in mountain terrain can be a significant risk during vehicular movements. Commanders should establish react to contact and react to ambush drills and standard operating procedures (SOPs) for unit movements in mountain terrain where maneuver space is limited. SOPs should include actions needed to move or remove disabled vehicles blocking routes into and out of enemy contact and ambush site. Enemy ambush tactics often include using terrain that channels friendly units into areas where movement is restricted, then disabling the front or rear vehicles to confine the unit to a kill zone. The surrounding elevated terrain allows them to fire onto the confined unit and then use the surrounding mountains for an escape where pursuit is difficult or impossible (see figure 5-2).

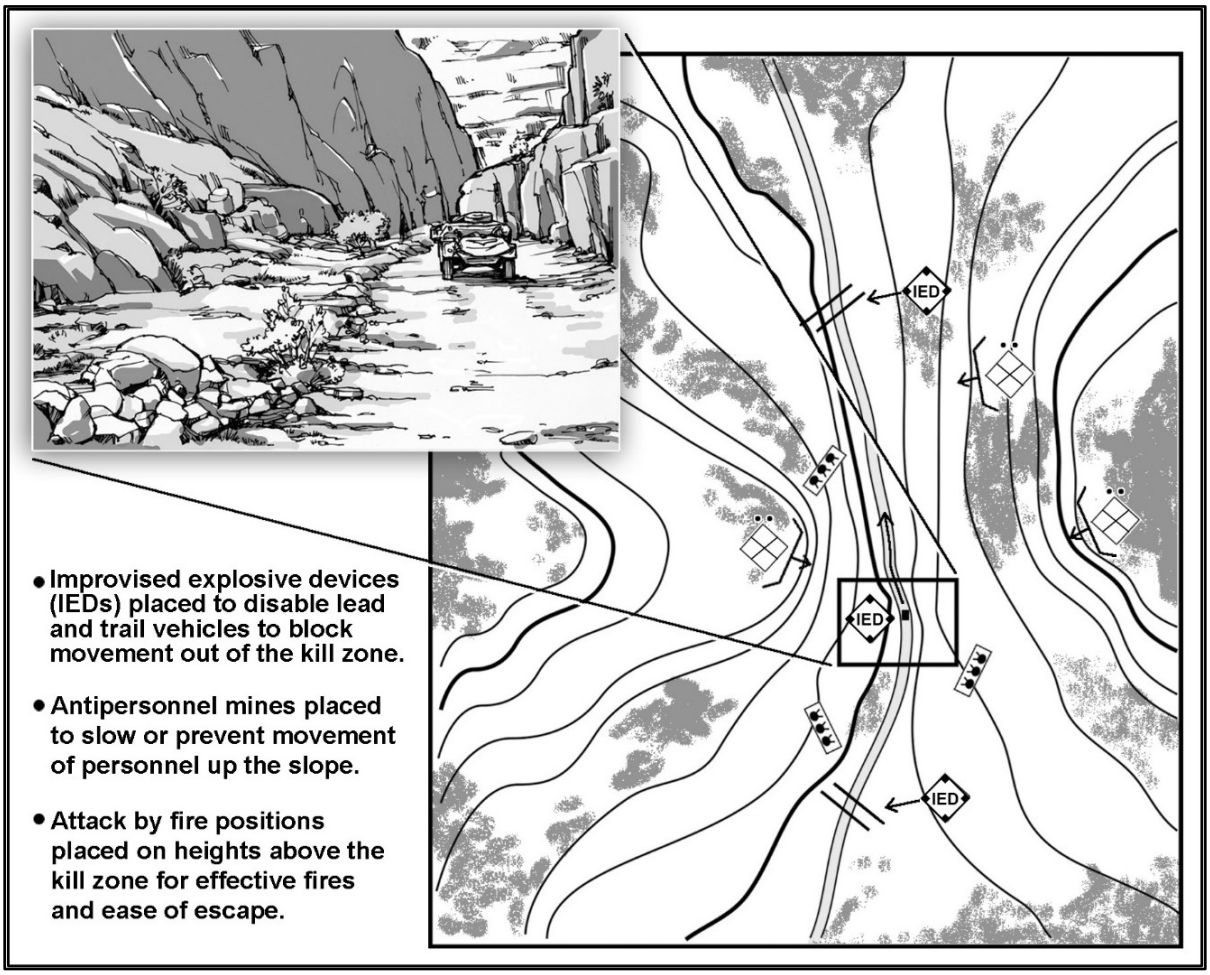


Figure 5-2. Enemy ambush on a narrow mountain pass

ROUTE CONSIDERATIONS AND SELECTION

5-16. Commanders and subordinate leaders study the terrain to determine feasible routes for an operation. The information collection effort includes topographic and photographic map coverage as well as climate data and weather effects based on the mission-limiting weather thresholds on the employment of friendly and adversary military capabilities in the unit's area of operations (AO). When planning mountain operations, small-unit leaders gather additional information concerning size, location, and characteristics of landforms, drainage, types of rock, soil, and density and distribution of vegetation.

Considerations Common to Mountainous and Cold Weather Regions

5-17. When possible, units add trails to their maps to aid in route selection and rapid mountain movements. Trails often add speed over cross-country or direct line movements but increase risk. In addition, maps may not show many washes and depressions, which could deceive leaders while selecting routes based on a map reconnaissance. Due to limited road and trail networks, and for security purposes, direct line or cross-country navigation may be necessary. Small-unit leaders consider alternatively traveling on and off trails to gain speed and minimize risk.

5-18. While selecting movement routes, commanders and subordinate leaders analyze all contributing factors, including security, feasibility, distance, time, and Soldier fatigue during and after movement. Faster routes may be less secure while more secure routes often take more time. Shortest routes may be more fatiguing than longer ones. Leaders decentralize movement control as much as possible to lower levels to

allow flexibility along selected routes. Varied terrain, erratic weather, and communication problems inherent to mountain environments may cause changes to the selected route during mission execution.

5-19. Commanders and subordinate leaders consider the use of an advance element for selecting and possibly marking routes if necessary. They use advance elements to identify hazards such as hidden crevices under snow or ice or to mark dangerous movements along steep grades during limited visibility conditions. The advantages and disadvantages of marking a route is considered as well, as it may be detected by the enemy, creating conditions for a loss of surprise or an enemy ambush.

5-20. During selection of a dismounted movement route based on terrain analysis, the commander includes considerations for the following:

- Enemy situation.
- Time available.
- Skill of troops.
- Equipment available.
- Natural obstacles.
- Weather.
- Compartmentalization of terrain.
- Military crest.

Security During Movements

5-21. Commanders and subordinate leaders maintain constant security for their units by selecting proper routes and movement techniques. Movement planning security measures and considerations generally include the following techniques and methods in paragraphs 5-22 through 5-25.

Overwatch

5-22. When moving in the mountains, units, when possible, use overwatching techniques. For example, lead elements of a company secure the high ground and provide overwatching fires as the rest of the company crosses at a lower elevation.

Silhouetting

5-23. When moving along a ridgeline, movement elements avoid silhouetting and move without allowing observation against the skyline. For example, moving just below the ridgeline avoids silhouetting and completely masks movement from the other side of the ridge.

Cover and Concealment

5-24. When moving in mountainous regions, units (when possible) use terrain features and vegetation to mask their movements. When planning, commanders and subordinate leaders take into consideration that movement above the timberline reduces the amount of protective cover and concealment available at lower elevations.

Multiple Routes

5-25. Using multiple routes during movements can reduce vulnerability to the enemy. Subordinate units, when possible, move separately from each other on multiple and unlikely routes. Special assault climbing teams, when available, can construct fixed ropes systems, hauling systems, traverse systems, and other unique mountaineering systems to provide access to higher elevation levels and alternate movement routes.

Terrain Class Mobility

5-26. Mountain terrain is operationally divided into terrain levels I, II, and III as described in chapter 1. For movement purposes, the general mobility classifications of unrestricted, restricted, and severely restricted terrain are more closely defined for mountain terrain. Mountain terrain is categorized into five classes for mountain movements based on the type of individual movement skill required to traverse it as shown in table 5-1. Operations conducted in classes 1 and 2 require little to no mountaineering skills. Operations in

classes 3, 4, and 5 require a higher level of mountaineering skills for safe and efficient movement. Commanders should include the types of terrain analysis shown in table 5-1 during planning and preparation for mountain operations.

Table 5-1. Terrain class mobility

Class	*Terrain*	*Mobility Requirements*	*Skill Level Required*	*General Mobility and Equipment*
1	Gentler slopes/trails	Walking techniques	Unskilled	Easy: Movement generally does not require specialized gear. A simple hand line or fixed rope may aid in movement.
2	Steeper/rugged terrain	Some use of hands		
3	Easy climbing	Fixed ropes where exposed	Unskilled (with some assistance) and basic mountaineers	Moderate: (exposed 3rd class) Use of fixed ropes required due to the injury potential of a fall. Technical mountaineering equipment will be required to negotiate the terrain.
4	Steep/exposed climbing	Fixed ropes required	Basic mountaineers (with assistance from assault climbers)	
5	Near vertical	Technical climbing required	Assault climbers	Hard: (exposed 4th class) Required fixed ropes, high lines, or hauling systems. All members of the patrol should be proficient at moving on these systems, as a fall may be catastrophic.

Effects of Slope on Dismounted Movement

5-27. The rise and fall of the ground is known as the slope or gradient (grade). Slopes of 7 percent or greater affect the movement speed along a route and are considered an obstruction. The percent of slope used to describe the effect that inclines have on movement rates is a key consideration when planning and preparing for a dismounted movement. The percentage of slope is the ratio of the change in elevation (the vertical distance to the horizontal ground distance) multiplied by 100. When planning routes, small-unit leaders factor elevation gains and loss, as much as distance, into their movement timelines as the effects of slope on dismounted movement is significant. (See ATP 3-34.81 for a complete description of slope calculation.)

5-28. As the percentage of slope increases, movement rates decrease due to the increase in energy and physical demands needed for movement. Moving to the same location using an indirect route can help reduce the amount of strenuous energy needed but increases time needed due to the total amount of terrain traversed. Regardless of whether the unit moves, uphill or downhill movement rates decreased.

5-29. Slopes covered in talus often prove to be a relatively easy ascent route. On the other hand, climbing a scree slope can be extremely difficult, as the small rocks tend to loosen easily and give way. This characteristic often makes scree fields excellent descent routes. Before attempting to descend scree slopes,

commanders should carefully analyze the potential for creating dangerous rockfall and take necessary avoidance measures.

Dismounted Movement Rates

5-30. A Soldier can only move as fast as the lungs and legs will allow. A trained, conditioned, and acclimatized Soldier often has endurance and moves efficiently. Rest, good nutrition, hydration, conditioning, acclimatization, proper training, and the will to climb are key. Terrain, weather, and light conditions also affect movement rates. Movement rates should be relative to the conditions. The more adverse the conditions, the slower the pace should be. Moving too fast, even under ideal conditions, can produce early fatigue, require more rest halts, and result in time loss.

5-31. The normal planning rate for dismounted troops moving on hard packed, gently rolling terrain is 4 kilometers per hour. When crossing snow or hilly terrain, this rate decreases. The terms unbroken and broken trail have specific meanings. An unbroken trail refers to paths through undisturbed (unbroken) snow. Unbroken trails slow movement and are more physically intense to cross. Broken trails refer to paths over packed or cleared snow. Broken trails are more solid and are easier to walk on. However, initial trail breaking is a time intensive and exhausting effort that requires multiple fire teams or squads to rotate. (See paragraphs 5-41 to 5-45 for route preparation [specifically, trail breaking procedures].) For unbroken trails, the movement rate on foot with less than 1 foot of snow is the same as Soldiers on snowshoes traveling over more than a foot of snow. Snowshoeing, skiing, and skijoring rates assume more than 1 foot of snow, which is required to use such equipment effectively. Skis are faster than snowshoes because they require less work to use. Finally, skijoring does not give a time for an unbroken trail in the table because Soldiers are behind a vehicle that is breaking the trail. Table 5-2 shows dismounted movement rates for mountain and cold weather environments.

Table 5-2. Dismounted movement rates

Movement Mode	*Unbroken Trail*	*Broken Trail*
On foot, no snow cover	2 to 3 kph—cross-country	3 to 4 kph—trail walking
On foot, no ski or snowshoe, less than 1 foot of snow	1.5 to 3 kph	2 to 3 kph
On foot, no ski or snowshoe, more than 1 foot of snow	.5 to 1 kph	2 to 3 kph
Snowshoe	1.5 to 3 kph	3 to 4 kph
Skiing	1.5 to 5 kph	5 to 6 kph
Skijoring	Not applicable	8 to 24 kph (for safety, 15 kph is the highest recommended speed)
Legend: kph—kilometers per hour		

Note. Add 1 hour for every 300 meters (984 feet) of ascent and 1 hour for every 600 meters (1,968 feet) of descent.

5-32. Leaders weigh the advantages and disadvantages of different movement formations. In snow-free terrain, a wedge formation can maximize fields of fire and allow for greater command and control (C2); however, when operating in a snow-covered environment, the ideal formation may be the column/file formation. Column/file formations are essential for trail breaking and mobility. In a snow-covered environment, Soldiers traveling in a wedge formation are forced to march through undisturbed snow (unbroken trail) and move slower. Wedge formations also create more tracks in the snow and make it easier for the enemy to detect the unit's location. However, a wedge formation may be appropriate if enemy contact is imminent.

5-33. Subordinate leaders adjust movement rates, coupled with proper Soldier spacing, to prevent an accordion effect during movement in mountain terrain. The spacing between Soldiers largely depends on the mission, the terrain, and visibility. Soldiers should allow enough distance between themselves to climb without causing the following individual to change pace. In mountain terrain, a slow, steady pace is preferred

to more rapid movement with frequent halts. Paragraphs 5-34 through 5-40 address additional considerations to help minimize Soldier fatigue and to ensure efficiencies during movements.

Movement Rate Evaluation Considerations

5-34. When traveling at a moderate pace, the need for rest halts can decrease and the chance of personnel overheating will often be less than traveling at a high rate. Minimization of halts enables units to cover a given distance in minimal time.

5-35. An adjustment halt taken during the first half-hour of movement is used to reduce Soldier fatigue and ensures efficiency throughout movement. Soldiers can loosen or tighten bootlaces as needed, adjust packs, and add or remove layers of clothing as appropriate.

5-36. Short rest halts taken every 1 to 1.5 hours can reduce Soldier fatigue during long movements. Depending on the situation, Soldiers should lean against a tree, rock, or hillside to relieve their shoulders of pack weight, breathe deeply, hydrate, and eat small amounts of food. Halts should be short (1 to 2 minutes) to avoid muscles stiffening. Take rests on level ground, if possible, and avoid steep inclines.

5-37. Longer rest halts may be taken later in the march if necessary due to fatigue or mission requirements. At these halts, Soldiers may need to put on additional clothing to avoid becoming chilled. It is much easier to keep a warm body warm than to warm up a cold one.

5-38. After a climb, Soldiers need a good rest to revive tired muscles. Use a rest stop for steep slopes, snowfields, and higher elevations. Rest stops help control the pace and limits fatigue by giving the lungs and legs a moment to recuperate between steps. Maintain a slow and rhythmic pace.

5-39. Soldiers should employ proper walking techniques and pause briefly after each step forward, relaxing the muscles of the forward leg while resting the entire body weight on the rear leg. The rear leg is kept straight with the knee locked so that bone, not muscle, supports the weight. After relaxing the forward leg, Soldiers scan their surroundings and ensure they focus on maintaining alertness and not just traversing the terrain.

5-40. Soldiers should synchronize their breathing with each rest step. The number of breaths per step change depending on the difficulty of the climb. Steeper slopes or higher elevations may require several breaths per step. It is especially important to breathe deeply when the air thins at higher altitude, using the “pressure breathing” technique. The Soldier should exhale strongly, enabling an easier, deeper inhale. This slow, steady, halting rest step is more efficient than spurts of speed, which is rapidly exhausting and requires longer recovery.

Route Preparation

5-41. Units prepare a route (when required) by trail breaking and route maintenance. Trail breaking is the preparation of snow surfaces by packing or clearing snow. Individual units usually prepare combat roads and trails by trail breaking because of heavy snowfall or wind drifts. Trail maintenance becomes a task repeated often to maintain line of communications. A significant snowfall or wind event can totally obliterate any trace of a trail. A well-maintained and marked trail is far easier to reopen than breaking a new one. If a unit must break their own trails during movement, then significant additional time must be accounted for (see paragraphs 5-30 to 5-33 and table 5-2 on page 88).

5-42. Dismounted trail breaking consumes a considerable time, effort, and energy. The first Soldier in line quickly tires depending on the load carried and depth of snow. One-third of the unit is allocated to trail breaking. The trail breaking party departs one hour earlier for each kilometer to travel. The platoon (patrol) leader is responsible for—

- Setting a course that maintains tactical security to the unit while maintaining ease of movement.
- Setting up the general trace using a map and aerial imagery.
- Making every effort to stay in mature forests and avoid areas choked with brush.
- Understanding that areas with brush make movement excruciatingly slow and risky and can easily alert the enemy from the noise they generate clearing a route or just moving through it.
- Ensuring Soldiers adhere to the trail marking SOP and cordon off-side trails or back-tracking trails to prevent units from taking a wrong turn.

- Providing guides, if necessary.
- Ensuring Soldiers have pioneer tools (the tools in an ahkio group [see paragraphs 5-61 and 5-62 and figure 5-7 on page 96] are enough for a squad to cut a trail).

5-43. The first procedure for the lead squad is that the squad leader designates the direction and instructs the lead Soldier to begin moving to establishing the initial track. The second in line does not step into the lead Soldier's tracks but steps opposite and flattens the tracks. The third and fourth Soldiers offset their steps left and right by at least one snowshoe width. This widens the trail to allow Soldiers to bring the ahkio. If necessary, these Soldiers are also the 'cutters.' Each one carries a machete to clear brush on the sides of the trail. They carefully cut branches close to the main trunk, so stubs do not become spears.

5-44. The squad leader focuses on navigation and keeps a march table to record where the unit is located. The leader relies on more than Global Positioning systems as batteries are easily drained in the cold. The squad leader ensures the two teams rotate as necessary. The trail team fills low spots with snow, straightens the trail if necessary, and provides security for the lead team. The lead squad in the platoon generally does not normally drag its own ahkio if it needs to break a trail or cut in very thick brush or deep snow. If the lead squad drags its own ahkio, breakers and pullers rotate more frequently in deep snow. Security can lapse very quickly when labor becomes difficult.

5-45. Rotation of the lead team is a big consideration. The lead fire team or squad moves forward for a set time or certain distance, then it rotates to the trail of their fire team or squad. The same applies to squads within a platoon. Trail breaking is a very demanding enterprise, physically and mentally. (See ATP 3-90.96 for additional information.)

Movements During Adverse Weather

5-46. Terrain and weather often restrict planned movements. Commanders prepared for wide variations in temperature and the various types and amounts of precipitation often experienced in mountain environments by erratic weather conditions. Storms reduce visibility during movements and severe storms may dictate halting movements and seeking shelter. When the tactical situation requires continued movement during a storm, leaders should attempt to avoid:

- Using ravines as movement routes due to flash floods.
- High pinnacles and ridgelines during electrical storms.
- Areas of potential avalanche or rockfall.

Vertical Danger Areas

5-47. In mountain environments, units will eventually have to cross steep terrain that requires additional equipment and climbing skills. These areas are often labeled as vertical danger areas. These crossings may require fixed ropes, rappels, or a suspension traverse. Soldiers trained on these systems and the techniques for their employment are required to ensure safety during movement. The same principles that apply to crossing linear danger areas, as described in ATP 3-21.8, apply to vertical danger areas including near- and far-side security. Units should have trained personnel at key points to ensure less trained personnel move safely along any fixed ropes. Actions on contact procedures should be established and rehearsed for contact experienced while moving along a fixed rope system.

Movement Over Snow

5-48. Snow and ice make traction less stable increasing the risk of injury from slips and falls. A slip near a steep mountain slope can quickly turn fatal if proper precautions are not taken. In addition to causing challenges for traction, snow is particularly dangerous due to hidden underlying hazards including cracks, crevices, and deep ravines. Movement over snow may require the aid of additional equipment such as snowshoes or other equipment. Specialized personnel or techniques may also be required depending on the terrain, slope, and depth of the snow. (See ATP 3-90.97 for an in-depth discussion of movement over snow and ice.)

INDIVIDUAL MOVEMENT TECHNIQUES

5-49. The basic principles of mountain-dismounted movement remain the same whether it is up scree or talus, through boulder fields or steep wooded mountainsides, or over snow- or grass-covered slopes. Soldiers should always keep their weight centered directly over their feet. Soldiers place feet on the ground to obtain as much (boot) sole-ground contact as possible. Footing should be on the uphill side of grass tussocks, small talus, and other level spots to avoid twisting an ankle or straining an Achilles tendon. Straighten the knee after each step and allow for rest between steps. Take moderate steps at a steady pace. Avoid any angle of ascent or descent that is too steep and use indentations in the slope to the advantage.

5-50. In addition to proper technique, pace is adapted to conditions. Soldiers should set a tempo, or number of steps per minute, according to the pace of the unit in which they are moving. Individuals should maintain their tempo while compensating for changes in slope or terrain by adjusting the length of their stride. Tempo, pace, and rhythm are enhanced when an interval of three to five paces is kept between individuals. This interval helps lessen the accordion effect of people at the end of the file who must constantly stop and start.

5-51. Downhill dismounted movement uses less energy than uphill movement but is much harder on the body. Stepping down can hammer the full body weight onto the feet and legs. Blisters, blackened toenails, knee damage, and back pain may follow. To avoid these problems, Soldiers should start by tightening bootlaces to ensure a snug fit and keep toenails trimmed. Keep a moderate pace and walk with knees flexed to absorb shock.

5-52. Soldiers should be extremely cautious while traveling on the side of a hill. During side-hill travel, personnel are more vulnerable to twisted ankles, back injury, and loss of balance when weighted down with a rucksack or assault pack. During side-hill travel, attempt to switchback periodically if possible and use any lower-angle flat areas, such as rocks, animal trails, and the ground above grass or brush clumps, to level off the route.

SPECIALIZED EQUIPMENT AND SKILLS

5-53. Depending upon the operation and the terrain itself, companies may find that they eventually cross terrain that requires a higher level of training and specialized equipment. Movement across this type of terrain often involves the use of ropes, mountaineering kits, and assault climbers.

Ropes

5-54. The most common type of rope installation in the mountains is the fixed rope system. A fixed rope is a rope anchored in place to assist Soldiers in movement over difficult terrain. Its simplest form is a rope tied off at the top of steep terrain. As terrain becomes steeper or more difficult, fixed rope systems may require intermediate anchors along the route. Moving on a fixed rope requires minimal equipment. The use of harnesses, ascenders, and other technical gear makes fixed rope movement easier, faster, and safer, but adds to total mission weight (see figure 5-3 on page 92).

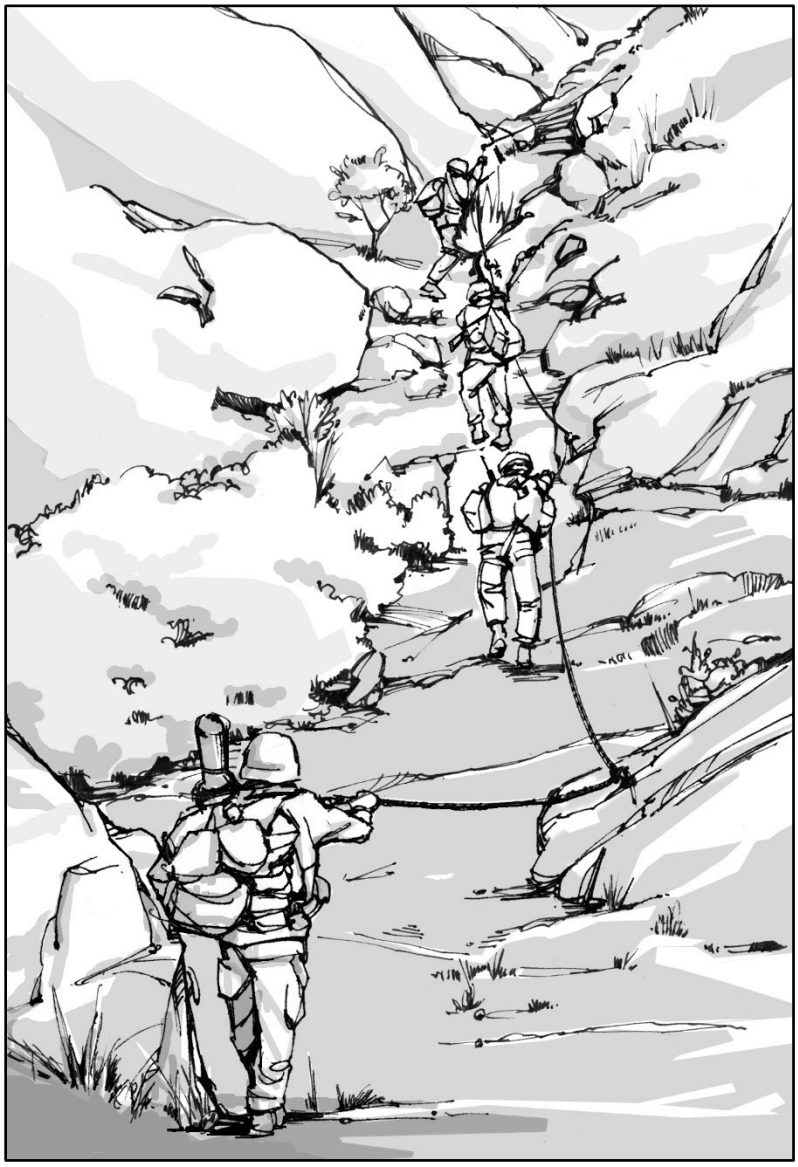


Figure 5-3. Using a fixed rope system

5-55. Squad slings and short ropes are valuable when the terrain becomes difficult. Body belays may be necessary at times and should be rehearsed by all company personnel prior to operations. (See ATP 3-90.97 for extensive detail on the use of ropes, rope systems, and the care maintenance of ropes.)

Mountaineering Kits

5-56. The Army mountaineering kits are made up of three separate but integrated kits of state-of-the-art, commercial equipment that meet the highest industry standards. The separate kits enable the commander to tailor the equipment to the mission environment.

High Angle Mountaineering Kit

5-57. The high angle mountaineering kit is designed for a minimally trained Infantry brigade combat team (IBCT) platoon (40 personnel) moving through steep terrain, void of ice or snow, on rope installations established by assault climbers. The high angle mountaineering kit provides each Soldier in the platoon with a harness, locking and nonlocking carabineers, sewn webbing runners, 7-millimeter (mm) accessory cord,

and a belay or rappel device. There are also static installation ropes, a rope cutter, and a rope washer (see figure 5-4).

Figure 5-4. High angle mountaineering kit

Assault Climber Team Kit

5-58. A trained assault climber team, of three personnel, uses the assault climber team kit to establish rope installations that minimally trained Soldiers can move instead of using the high angle mountaineering kit. The assault climber team kit provides each Soldier in the assault climber team with a harness, locking and nonlocking carabineers, sewn webbing runners, mechanical ascenders, chock pick, assault climber bag, 7-mm accessory cord, and a belay or rappel device. Within the kit, there are dynamic climbing ropes, and rock protection equipment including spring-loaded camming devices and chocks (see figure 5-5 on page 94).

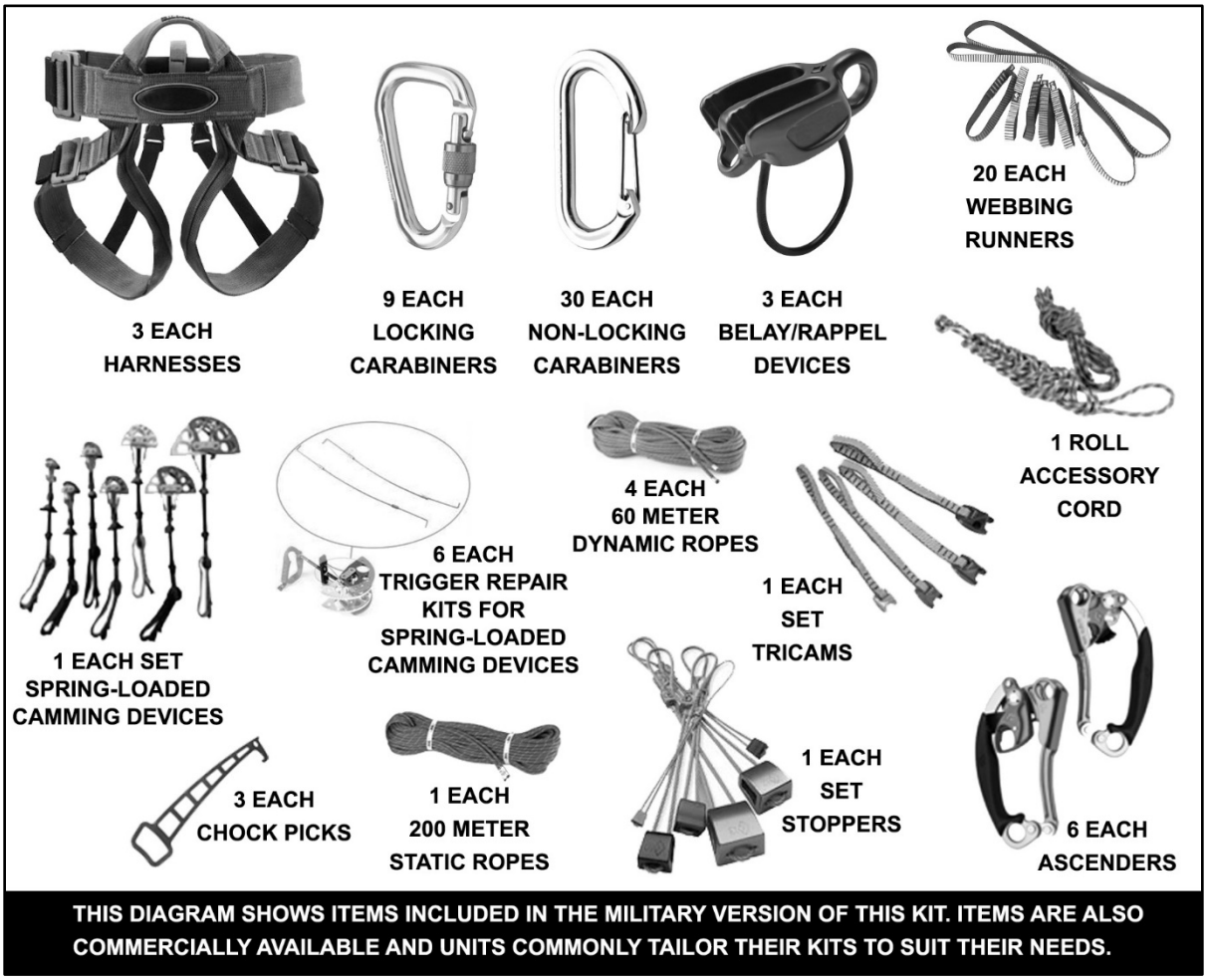


Figure 5-5. Assault climber team kit

Snow and Ice Mobility Kit

5-59. The snow and ice mobility kit is used by an Infantry platoon trained in the techniques of operating in steep terrain covered by snow or ice. The snow and ice mobility kit provides each Soldier in the platoon an avalanche transceiver, crampons, ice axe, and snowshoes. There are also avalanche shovels, probes, and ice and snow anchors included (see figure 5-6).

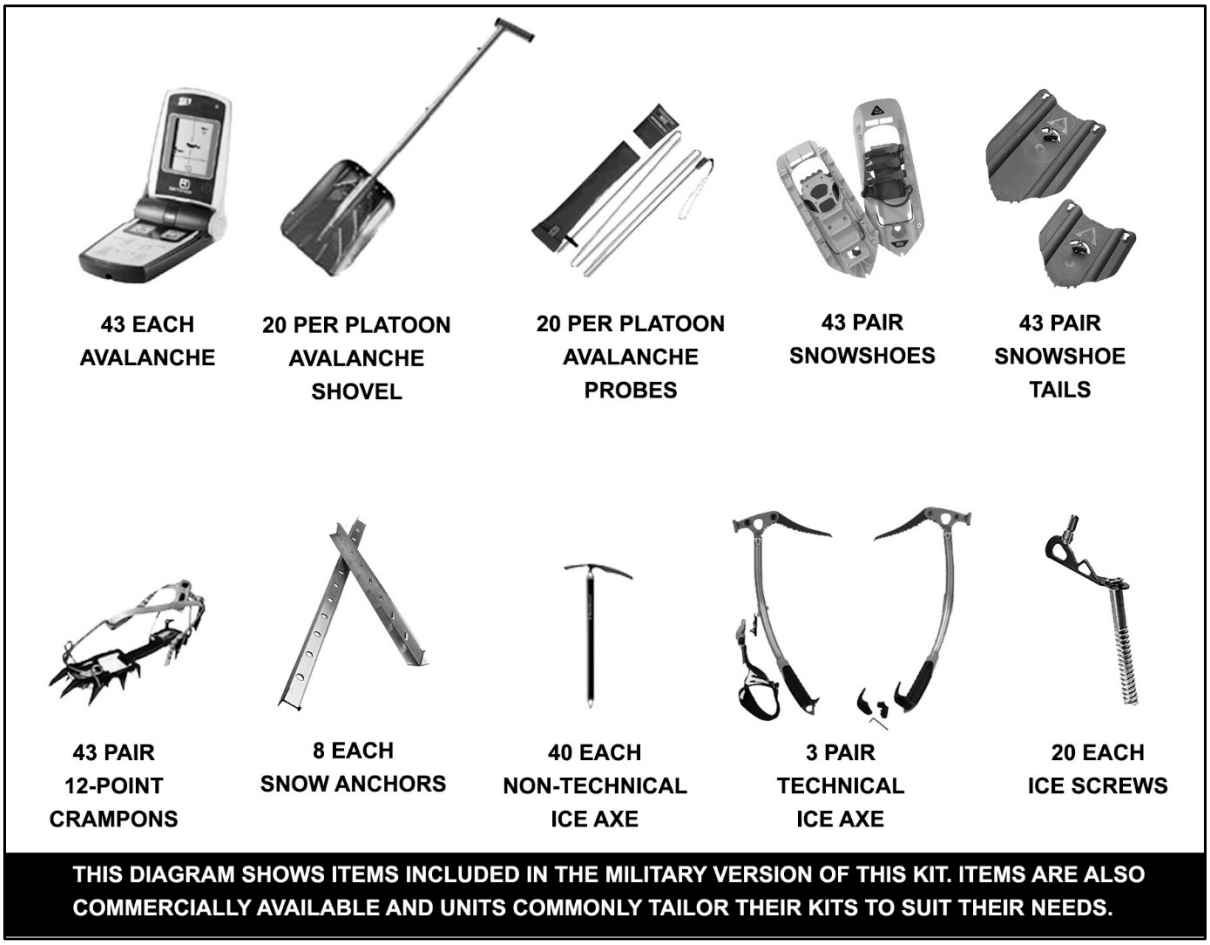


Figure 5-6. Snow and ice mobility kit

Assault Climbers

5-60. Assault climbers are responsible for the rigging, inspection, use, and operation of all basic rope systems. They are trained in additional rope management skills, knot tying, and belay and rappel techniques, as well as using specialized mountaineering equipment. Assault climbers are capable of rigging complex, multipoint anchors, and high-angle raising/lowering systems. Infantry small units should employ basic mountaineers whenever possible when operating on moderate class 2 to 4 terrain and assault climber teams whenever operating on hard class 4 or 5 terrain. Leaders may consider having their reconnaissance and surveillance (R&S) personnel, including Soldiers assigned to reconnaissance platoons and snipers, as qualified assault climbers. (See ATP 3-90.97 for additional information on knowledge and skills of an assault climber.)

Cargo Sleds

5-61. Cargo sleds are pulled sleds used to transport equipment. Military units most often use the ahkio sled. (See figure 5-7 on page 96 for an illustration of an ahkio sled.) These sleds can carry 200 pounds (90 kilograms) over difficult terrain to include carrying tents, heaters, fuel, rations, and other necessary items of each tent group. Soldiers use the ahkio for carrying weapons and ammunition. Soldiers can also use them as firing platforms for machine guns in deep snow and to evacuate casualties. Without ahkios, equipment loads may encumber Soldiers moving through snow.

5-62. Pulling an ahkio is difficult and conducted with rotating teams. It is easiest to pull an ahkio with snowshoes. However, if using skis, Soldiers wax the bottom runners to provide more grip than glide on the snow. Solders also use climbing skins that attach to the undersides of skis to provide traction. During early

winter when little snow lays on the ground, cargo sleds catch on exposed logs and brush and drastically slow movement. Commanders decide when it is best to use cargo sleds and when to leave them behind.

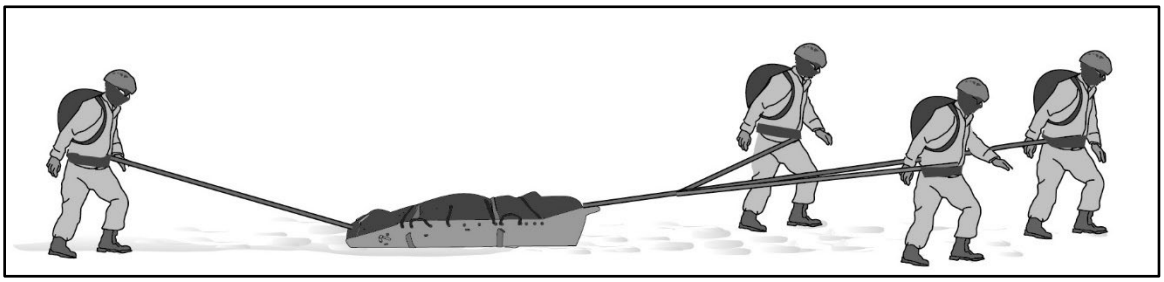


Figure 5-7. Ahkio sled

AIR MOVEMENT AND AIR ASSAULT

5-63. Air movement and air assault missions are a feasible option for movement and the conduct of combat missions in a mountain environment. Movement of personnel and supplies by air can be relatively quick and efficient and is widely used in mountain operations. While air movement conserves time and energy, limited aircraft, mountain terrain, and weather conditions can place restrictions on air movement. An air assault can be an independent operation or used in conjunction with other offensive operations. For example, a commander can conduct an air assault to insert a unit to block a likely egress route for an enemy escaping another attacking force. (See FM 3-99 for more information on air movement and air assault operations.)

Planning Considerations

5-64. In mountain environments, the enemy will probably have observation on any aircraft including those used for an air movement or an air assault. During an air assault, if the insertion is to be clandestine, leaders may have to take advantage of limited visibility conditions as well as other measures such as false insertions used for deception. For example, the use of multiple aircraft can confuse the enemy on the actual location of the insertion. During planning, the commander identifies primary and secondary landing zones (LZs) for insertion force. The commander then considers how far the insertion point is to the objective keeping in mind that traversing long distances in the mountains on foot can quickly exhaust Soldiers. After the operation, the commander identifies an extraction point (primary and alternate pickup zones) for pickup.

5-65. In mountainous terrain, an air assault operation can be risky. For example, if a friendly unit encounters a larger enemy force than expected, reinforcements may not be readily available or may not be able to assist the unit in a timely manner. Another consideration for leaders planning an air assault mission in the mountains is the ever-changing weather conditions. Many weather conditions can ground aircraft during any part of the operation. Adverse weather may cause the mission to be aborted or, if forces are already on the ground, alternative measures for extraction or exfiltration may have to be initiated.

Effects on Aircraft

5-66. Flying can be an extremely dangerous operation in mountain environments and is aggravated further when coupled with potential enemy contact. The use of aircraft in these environments should be a carefully planned, prepared for, and executed operation. Relying heavily on aviation assets for transportation and movement in mountain regions requires aviation planners to be involved in the planning process early. Additionally, commanders must be intimately familiar with the conditions that may limit the full effectiveness of Army aviation when considering their use for an operation in a mountain environment.

5-67. Determining when aircraft may or may not fly, where they may fly, and what weight limitations they have for a particular mission, results from a combination of factors that largely include terrain and weather conditions. Commanders obtain that type of data from the brigade aviation element to use during the planning of operations that include air assets. Weather can cancel the use of aircraft for extended periods in mountain climates. Sudden weather changes may also preclude the use of aircraft (lift and attack aircraft) scheduled for company movement and attack operations for a particular mission. Leaders should consider whether those same restrictions preclude the use of aircraft if needed for casualty evacuation (CASEVAC).

5-68. Utility and cargo helicopters remain key to the rapid movement of Soldiers and equipment in the mountains. Even so, any operation that depends primarily on continuous aviation support to succeed is extremely risky. High elevations and rapidly changing and severe weather common to mountain environments restrict aviation operations and can make availability of aviation support unpredictable. At high altitudes, weather that appears to be stable to the ground observer may significantly affect helicopters. During the planning of operations, leaders should account for contingencies based on changing weather conditions that may affect aircraft.

Altitude

5-69. High altitude atmospheric changes can have a dramatic effect on air platforms. As elevation increases, air density decreases, air becomes thinner, icing is common, and lift is decreased. At some point, lift decreases to the extent that aircraft can no longer remain airborne. Certain mountain ranges and peaks are simply too high for some rotary-wing aircraft to cross.

5-70. Even though the terrain, weather, and enemy allow for movement by air, commanders should also consider the effect of altitude on Soldiers when planning movement of personnel. If possible, commanders should use Soldiers acclimatized at or above the elevation level planned for the air movement. Depending on the situation, it may be better to have troops walk in rather than fly into the necessary elevation level allowing them more time for acclimatization.

Landing Zones

5-71. In planning the use of aircraft, the commander designates suitable LZs. Terrain suitable for multiple helicopter LZs in mountain environments may be limited. A level area suitable for a mountain LZ is usually firm enough to support helicopters and frequently requires little preparation beyond the clearance of loose material. If possible, LZs should be located where aircraft can take off and land into the wind and without restrictions from surrounding terrain. Generally, helicopters should attempt to land on relatively level terrain. Slope landing is possible but should be coordinated with the aircraft due to variations in aircraft restrictions. Aircraft should avoid landing on a down slope (see figure 5-8).

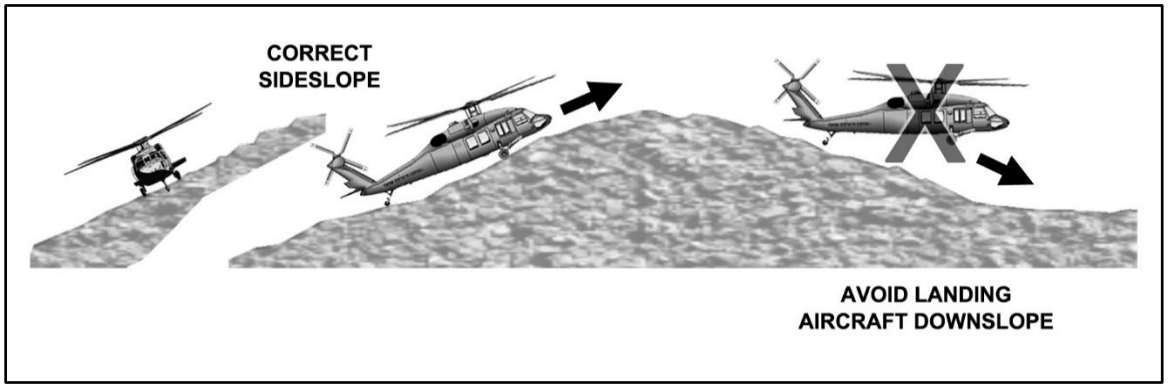
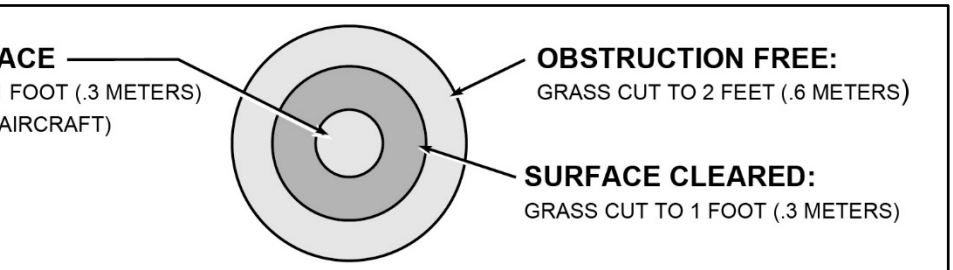


Figure 5-8. Helicopter slope landings

5-72. If LZs must be constructed, clearing may be difficult due to the rocky ground. Standoff space from rock wall faces should be cleared and a level-landing surface created. Demolitions may be required to clear large rocks, but care should be used to prevent rockslides or avalanches started by the explosive shock. During the winter, snow should be packed to prevent whiteouts. Similarly, sandy or dusty LZs should be dampened with water to prevent brownouts. Minimum requirements for helicopter LZs are shown in table 5-3 on page 98.

Table 5-3. Helicopter landing zone requirements



LANDING POINT	MINIMUM DIAMETER OF LANDING POINT	HARD SURFACE	SURFACE CLEARED	OBSTRUCTION FREE
LIGHT UTILITY AND ATTACK UH-1H H-65 AH-1W	35 METERS	10 METERS	20 METERS	35 METERS
MEDIUM UTILITY AND ATTACK UH-60 H-2 AH-64	50 METERS	15 METERS	35 METERS	50 METERS
CARGO CH-47 CH-53	80 METERS	15 METERS	35 METERS	80 METERS

5-73. When only single aircraft LZs are available, in-flight spacing between helicopters should be significantly increased. Although LZs should be located on the windward side of ridges or peaks to take advantage of the more stable winds, concealment from enemy observation and the mission are extremely important factors in site selection in forward areas.

5-74. Rotary-wing aircraft may be forced to insert personnel from a low hover, by rappelling, or by fast rope if an LZ is not available. Equipment and supplies may have to be delivered or dropped without landing as well. (See ATP 3-21.20 for a detailed discussion of aerial resupply.) When it is impossible for helicopters to land, personnel may rappel and light equipment may be sling-loaded, dropped, or lowered by rope at an insertion point while the helicopter hovers. This may increase turnaround time and aircraft vulnerability. Since available landing sites are often limited, the enemy can be expected to target all likely locations. Personnel should secure terrain that dominates an LZ to increase security and coordinate for suppression of enemy air defense weapons during air assault operations.

5-75. The terrain, weather, and potential for enemy actions make landings a risky aspect of air movements. Units should assume LZs are being observed by the enemy and plan accordingly.

Flight Routes

5-76. Rugged mountain terrain complicates flight route selection and places an additional navigational load and strain on the entire crew. There is little margin for error for aircraft flying near the mountains. Direct routes can seldom be flown without exposing aircraft to an unacceptable risk of detection and targeting by the enemy. Tactical flight routes follow valley corridors, where it is possible to obtain cover and concealment while maintaining the highest possible terrain flight altitude. Terrain flight routes in the mountains may

preclude using closed formations. Multi-helicopter operations are normally flown in “loose” or “staggered trail” formations with increased spacing between aircraft.

Loads

5-77. During passenger moves, passengers and equipment for multiple destinations may be carried. Aircrews will plan accordingly to ensure minimal time is spent in off-load and on-load procedures but delays on the LZ can occur. This increases the risk of detection by enemy personnel and increases the risk of damage or destruction from enemy direct or indirect fires.

5-78. As altitude increases and lift and aircraft power available decreases, the ability for aircraft to carry a full combat load decrease. For high altitude operations during air assaults or air movements, this may result in fewer Soldiers and less equipment per aircraft. This may require units to plan for more aircraft or more chalks during missions. Coordination with aircrews during the mission planning process will enable the commander to plan adequately for such contingencies.

OTHER MOVEMENT ASSETS

5-79. The use of nonstandard means of transportation to aid in movements is routine in mountain environments. This is especially true in third world countries where forces often operate. The use of pack animals, for example, to aid in the movement of supplies and equipment is a standard practice in many mountain environments. (See chapter 6 for more information.)

5-80. Other mobility assets that can aid in movement of personnel, equipment, and supplies include terrain vehicles, nonstandard tactical vehicles, and motorcycles. Many of these assets can be purchased or contracted from the host nation. While military vehicles tend to be more robust, often these vehicles are better designed to maneuver or travel on available mountain roads and trails.

PATROLS AND PATROLLING

5-81. Mountain environments often span vast distances with friendly units operating in noncontiguous assigned areas. Within these AO, the enemy will strongly defend some locations such as certain key terrain, villages, strong points, and other areas. Often there are other large areas where neither friendly nor enemy units are concerned with the retention of terrain. The enemy operating in these areas is often more concerned with inflicting damage on friendly forces than on holding or defending a piece of ground. In this environment, the enemy often engages friendly units at the time and place of their choosing and then leaves the area. This makes planning offensive operations a challenge and often does not create many opportunities for planned deliberate attacks. For this reason, mountain operations conducted by Infantry small units are often conducted using combat patrols.

Combat and Reconnaissance Patrols

5-82. In the offense, combat patrols may be in the form of a raid or an ambush. Infantry small units conduct raids, ambushes, and combat patrols against known or suspected locations where the enemy is or is expected to be. For more information on raids and ambushes in the mountains, see chapter 3. Commanders use reconnaissance patrols, to include security patrols (see ATP 3-21.8, chapter 7 for information on these types of patrols) extensively within mountainous AO. Each patrol mission should have a clear task and purpose, with the commander and subordinate leaders clearly understanding the objective and actions taken upon enemy contact for each patrol.

Overwatch

5-83. Regardless of the type of patrol, techniques for movement through the mountains while on patrol are similar. In the mountains, moving elements of the patrol, when possible, are covered by another overwatching element of the patrol (see figure 5-9 on page 100). The bounding of sub-elements to overwatch the movements of other elements is vital to maintaining security. Leaders should assume they are being observed by the enemy throughout their entire mission. Commanders and subordinate leaders conduct patrols within range and cover of indirect fires, aviation assets, or both. Operations without these covering fires expose the patrol to extreme risks. If the availability of aircraft is limited, the need for available indirect fire coverage increases.

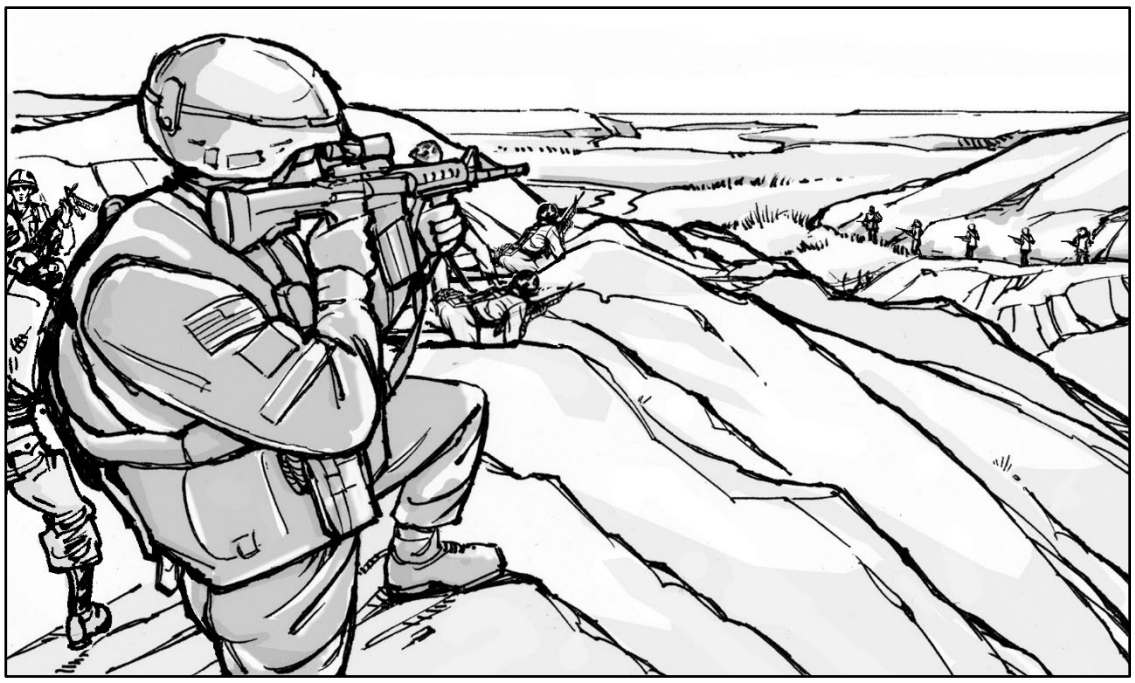


Figure 5-9. Overwatching a patrol

Finding the Enemy

5-84. A unique characteristic of fighting in the mountains, especially against an enemy familiar with the terrain is that the enemy is hard to find. Mountain terrain offers protection from observation to those not wanting to be seen or discovered. Contact is often initiated by the enemy rather than by friendly units. When contact is made, it is often in the form of an ambush with standoff and egress routes for the enemy.

5-85. Commanders and subordinate leaders conduct reconnaissance and security patrols in the mountains for varied purposes. Reconnaissance patrols and surveillance efforts are used to help determine, prepare for, or enhance follow-on offensive operations. The commander uses reconnaissance to detect or observe enemy actions, and to look for signs of enemy forces or actions such as enemy caches, trails, caves, tunnels, or other signs of enemy presence. Reconnaissance patrols do not seek to make physical contact with the enemy but rather are used to gain information. Leaders use security patrols to provide early warning, and to provide protection between friendly forces as an economy of force effort.

5-86. In contrast to reconnaissance patrols, security patrols are often attempts to make contact with the enemy or are associated with protection of an area, such as a unit location or key terrain. These patrols are often sent out to patrol areas with poor observation or fields of fire. They seek to make enemy contact but should be covered by indirect or aviation assets. Security patrols are often used as an integral part of defensive operations in mountain environments. Commanders use security patrols to cover unobservable areas and keep the enemy out of the area. During the conduct of security patrols, Soldiers become familiar with their surroundings—making it easier to spot something that may indicate a potential enemy action.

Patrol Base

5-87. When a unit halts for an extended period while patrolling, it often establishes a patrol base. (See ATP 3-21.8, chapter 7 for additional information on patrol base activities.) In mountain operations, patrol bases are often used due to the remote, difficult terrain in which patrolling operations are conducted. Patrols may often be conducted for extended periods requiring the establishment of one or more patrol bases. While occupying a patrol base, both active and passive measures are taken to provide maximum protection. The leader selects an area that provides passive security from enemy detection and organizes the base and personnel for occupation. Common situations exist that require establishment of a patrol base.

Situations Requiring Establishment of a Patrol Base

5-88. There is a need for a base to formulate final plans and issue orders for offensive and defensive actions and from where several consecutive or concurrent operations such as ambush, raid, reconnaissance, or surveillance patrols can be conducted.

5-89. When ceasing all movement to avoid detection or hiding the unit during a lengthy, detailed reconnaissance of the objective area, for reorganization after a patrol has infiltrated the enemy area in small groups (used in conjunction with a linkup point) and to prepare food, maintain weapons and equipment, and rest after extended movement.

Evacuating a Patrol Base

5-90. Evacuation of a patrol base depends on the degree of control the enemy force has in the base area, their ability to react to the discovery of a base, and their ability to affect the unit's mission. When an enemy force is relatively small and weak, patrol base secrecy may not be an overriding consideration and evacuation may or may not be necessary. In an area controlled by a larger enemy force or where safety of unit personnel is compromised, evacuation may be required. (See ATP 3-21.10, chapter 3, section I for information on situations unique to exfiltration from enemy-controlled areas.)

Patrol Bases in Mountain Terrain

5-91. Patrol bases established in mountain terrain offer unique challenges. Units establishing patrol bases should quickly learn how to use the terrain to their advantage. They should equally ensure they do not offer the enemy a chance to capitalize on opportunities created by the establishment of a patrol base in a poor location. Leaders should avoid establishment of a patrol base during daylight hours if possible. Patrols may stage during daylight but should move to a new location during darkness. Moving at night can confuse the enemy and keep them guessing as to the patrol's location. If possible, leaders should attempt to overwatch a previously occupied patrol base for enemy activity.

5-92. During establishment of a patrol base in mountain terrain, an important consideration is a terrain analysis. Ravines, depressions, irrigation tunnels, ditches, and other features offer unobservable avenues of approach for the enemy. While not always possible to avoid areas without these features completely, selection of the base should consider how these areas would be covered for security of the base. (OPs) require manpower but may be established to increase security of the base and cover some avenues of approach. Leaders should consider covering some avenues effectively using early warning signaling devices, command-detonated claymores or networked munitions.

Dismounted Patrols

5-93. Dismounted patrolling in mountain terrain encompasses all the fundamentals of patrolling in other environments with special considerations on the unique aspects the mountains create. As a rule, all tasks involved in dismounted operations slow down as altitude increases. Dismounted patrolling in mountain terrain is tedious, exhausting, and physically and mentally demanding. Thin air at high altitude, rugged terrain, and extreme weather conditions create an environment that can quickly drain the strength and endurance of Soldiers. Slower operations at high altitudes often result in less terrain coverage during each patrol. Soldiers should remain vigilant while on patrol and avoid the tendency to concentrate on moving, climbing, and traversing obstacles rather than staying alert to their surroundings.

5-94. One important factor a commander should consider while planning dismounted patrols in mountain terrain is use of an overwatching element. A typical mountain patrol often consists of one or two squads. One element, a squad or a fire team, overwatches the other as it moves. The overwatching element positions on a piece of terrain, most often high ground, where it can effectively cover the movements of the moving element. It should pay particular attention to areas such as depressions, cracks, crevices, rock formations, and draws where enemy personnel can easily hide undetected by the moving unit.

5-95. Dismounted patrolling in mountain environments often begins with movement by some means of transportation to or near the patrolled area. When the commander uses vehicles to transport personnel to a dismount location, leaders have two main options when considering what to do with the vehicles after

drop-off. The first option is to send the vehicles to another more secure staging area, or back to the departure point from a location such as a combat outpost or other base, until needed for pickup of personnel. The second option is to leave the vehicles in or near the drop off location where they can emplace the heavier 120-mm mortar in support of the patrol. The decision on what to do with the vehicles relies on many factors with some of the main considerations being:

- Length of the patrol.
- Use of available covering artillery or mortar fires.
- Security of the vehicles and personnel remaining with the vehicles.
- CASEVAC and medical evacuation (MEDEVAC) procedures.

5-96. Leaders should also determine what their Soldiers carry with them on a dismounted patrol. Leaders should ensure Soldiers only carry what is necessary for the duration of the mission—combat load. (See section III for information on Soldier load.) Body armor, weapons, and ammunition all weigh the Soldier down. Assault packs often consist of little more than water, food, additional ammunition, a lightweight blanket, survival gear, and some medical supplies. When resupplied, this often comes by way of aerial resupply since travel back to a resupply pick up location is often much more exhausting and time consuming.

Mounted Patrols

5-97. The upper levels of mountain terrain are generally not well suited for mounted patrols. While some mounted patrolling can be accomplished, patrolling often involves a combination of both mounted and dismounted movement. Dismounted movement through mountain terrain can be exhausting. To help maintain Soldier strength and energy, units often use some sort of vehicle transportation to move up to or closer to the actual targeted patrol area. Usually this is to a point where the vehicles can no longer effectively travel or to a point, that best accommodates the intended mission or for the protection of the vehicles. At that point, the unit dismounts and continues with the mission.

5-98. Dismounted Infantry units may be augmented with military vehicles, allowing them to conduct mounted patrolling. They may also procure some other type of vehicles. Four-wheel drive all-terrain vehicles can be used to conduct mounted patrolling and can travel into areas nonnegotiable by military vehicles.

5-99. Mountain terrain offers many opportunities for enemy ambushes or other hostile actions, especially along known restrictive roads, routes, or paths where vehicles must travel. The terrain generally affects a leader’s decision on vehicle spacing and speed and often dictates a column style formation due to the restrictiveness of the routes. As with all patrols, mounted patrols should be within the covering fires of artillery or aviation assets. Patrolling outside these conditions is extremely risky.

5-100. In planning mounted patrols, leaders should determine a specific task and purpose for the patrol and consider all the mission variables of METT-TC (I), which stands for mission, enemy, terrain and weather, troops and support available, time available, civil considerations, and informational considerations, along with particular considerations for:

- Procedures for enemy contact.
- Mounted and dismounted portions of the patrol.
- Location of vehicles during dismounted operations.
- Carrying mortars with the patrol for indirect fire support.
- Use of artillery and aviation assets.
- Recovery options for damaged or disabled vehicles.
- CASEVAC and MEDEVAC procedures.
- Length of patrol.

OBSERVATION POST

5-101. An *observation post* is a position from which observations are made or fires are directed and adjusted (FM 3-90). All OPs should possess appropriate communications. While aerial observers and sensors systems are extremely useful, those systems do not constitute aerial OPs. Employment of OPs can vary from a small two-Soldier occupied position supporting a larger unit to a platoon-sized position (see ATP 3-21.8 for a detailed discussion). The primary mission of an OP is to watch and listen for activity, to provide security,

and to report identified activity. OPs can be used in the defense of an established company position or positioned to observe and gain information for subsequent offensive actions.

OPERATIONAL CONSIDERATIONS

5-102. In mountain terrain, the detection of enemy locations can be extremely difficult. An effective way to find the enemy is to physically see personnel moving in and out of their locations when they believe they are not being watched. OPs used for these purposes tend to be clandestine operations and information gained from them often supports other offensive actions. Observers infiltrate to the OP location and observe without being detected. OP personnel report enemy locations, strengths, and activities in preparation for, during, and after subsequent offensive operations.

5-103. Personnel designated to occupy an OP must be prepared to traverse difficult infiltration routes, especially if the infiltration is to be unobserved. OPs are often placed in high terrain with little or no easy access. Additionally, clandestine operations requiring unobserved infiltration often require movement through unlikely avenues including steep cliffs with a difficult climb. Commanders should consider whether the use of special teams or equipment might be needed to assist in the infiltration and exfiltration of OP personnel.

5-104. Enemy personnel have the same basic needs for sustainment supplies as friendly units and at times must leave their cave, tunnel, or hiding place to obtain them. Observers placed in areas or trails known to be used by enemy forces can watch for activity and if needed, adjust the OP position to eventually trace the enemy back to their starting position. Snipers and scouts (see ATP 3-21.20) are ideal for this type of operation, as they are both skilled in advanced camouflage and observation techniques. Leaders should consider providing OP personnel with available equipment, such as enhanced optics (see paragraph 5-109), that could improve their observation activities.

MANNING AND EQUIPMENT

5-105. For planning purposes, an OP is a position where military observations can be made, and fires can be directed and adjusted. OPs must possess appropriate communications. The OP can be short-term (12 hours or less) or long-term, depending upon guidance from higher. Unlike a vantage point, the OP is normally occupied, and surveillance is conducted for a specified period. Leaders should consider the length of time OP personnel can operate until they need to be relieved.

5-106. At least two Soldiers are required to operate an OP. One Soldier establishing security, recording information, and reporting to higher authorities while the other observes. The Soldiers switch jobs every 20 to 30 minutes because the observer's efficiency decreases with time. Three or more Soldiers are required to increase security. For extended periods (12 hours or more), the unit occupies long-duration OPs by squad-sized units. Essential equipment of the OP includes the following:

- Map of the area.
- Compass and when available a Global Positioning System.
- Communications equipment.
- Observation devices (binoculars, observation telescope, thermal sights, and night vision devices).
- Automated net control device essential information.
- Report formats contained in the unit's SOP.
- Weapons.
- Protective obstacles and early warning devices.
- Camouflage, cover and concealment, and deception equipment as required.

SITE SELECTION

5-107. Along with the considerations of the mission variables of METT-TC (I), site selection for an OP mainly depends on the mission or purpose for establishing the OP. OPs overwatch areas where enemy activity is expected, view likely avenues of approach, and view dead space only observable from its location.

5-108. Unlike sites selected for covert offensive OPs, the commander may position observable defensive OPs. For example, the commander may deliberately place an OP in a particular location to deter enemy activity. These sites may be along supply or movement routes or in a strategic location outside a base location.

In the mountains, Soldiers may occupy OPs on a mountain ridge overlooking enemy territory assisting in denying free access or passage along movement routes (see figure 5-10).

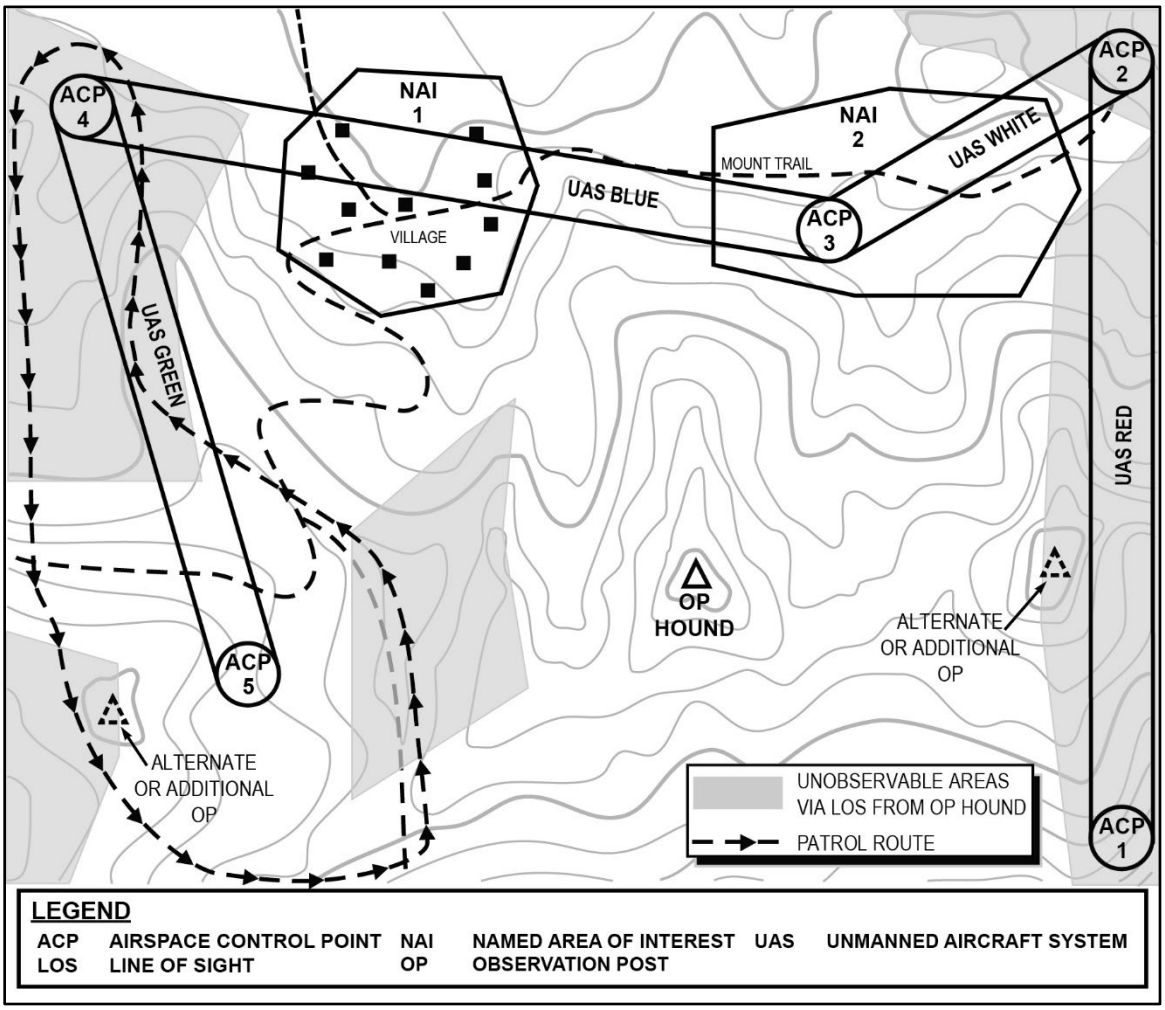


Figure 5-10. Observation post

ENHANCED OPTICS

5-109. Whenever possible, OPs should include enhanced optics systems to aid in observation. These systems are critical for improving operations during limited visibility conditions and greatly aid in long-range detail enhancements. Along with company-level assets, such as the command launch unit for the Javelin close combat missile system (CCMS), common battalion level and above systems that may be available to a company include the improved target acquisition system from a weapons company and the long-range advanced scout surveillance system from a reconnaissance troop. The commander positions these systems in OPs to aid in long-range target surveillance and acquisition.

Improved Target Acquisition System

5-110. The M41 improved target acquisition system that accompanies the tube launched, optically tracked, wire-guided/wireless guided missile system is an integrated day/night sight that enhances observation ability during daylight or limited visibility conditions. This system is a tremendous asset when positioned in an OP. The weapons systems provide for defensive measures, and in the case of overt OPs, help establish a sense of deterrence for aggressive behavior. Weapons may be either vehicular or ground mounted.

Long-Range Advanced Scout Surveillance System

5-111. The long-range advanced scout surveillance system, a long-range multi-sensor system, provides real-time detection, recognition, identification and pinpointing of distant target locations. The long-range advanced scout surveillance system is deployed on the M1114 high mobility multi-purpose wheeled vehicle in its mounted configuration and can be used on a tripod for dismounted missions. This system provides precise target location by incorporation of advanced second generation forward looking infrared, a global positioning interferometer, an eye-safe laser range finder, and a television camera.

COMBAT OUTPOST

5-112. Mountain operations conducted over large areas in some incidences have shown a need for establishing multiple small friendly unit locations. The employment of these locations enables U.S. Forces to protect or maintain contact with the local populace, protect friendly units, control areas, and support subordinate unit operations and personnel over a wide battlefield.

OPERATIONAL CONSIDERATIONS

5-113. In mountain environments, commanders routinely build and use combat outposts for these purposes and according to the mission, terrain, and relation to other surrounding structures. Combat outpost defensive plans allow leaders or commanders to operate for extended periods from these positions. These bases are often small, company-sized or smaller and usually supported by a larger battalion-size forward operating base. Combat outpost defensive plans provide security for the personnel within the confines of the position itself as well as other personnel or areas specifically assigned in their mission.

5-114. Leaders or commanders plan, construct, and organize combat outposts to accommodate their particular missions. They range in size, composition, and location depending upon their mission. Commanders often have the freedom to design the dimensions of the outpost to be in concert with the uniqueness of the surrounding terrain and still support the mission. Often a significant difference between individual combat outposts is the relation of each to a populated town or village. Combat outposts located near a population often require less infrastructure development than those in more remote locations. Security may be a greater challenge near a population while remote location combat outposts have more flexibility of placement and position for optimal observation and standoff.

5-115. Defense of a combat outpost in the mountains is concentrated on site design and operating procedures favorable to defending units. Design and operations should concentrate on retaining the initiative by making the enemy react and unable to execute their own offensive plan. Defensive security measures include establishing security plans and positions, clearing, identifying, and controlling dead space, placing obstacles in avenues of approach, creating target reference points and final protective fires, and requesting indirect fire targets. Commanders use frequent active patrolling outside the confines of the combat outpost to guard against covert enemy activity.

SITE SELECTION

5-116. In mountainous regions, the enemy often enjoys freedom of maneuver. By the nature of these regions, control of large areas of mountain terrain is extremely difficult and brings with it a unique set of challenges. In Afghanistan, for example, enemy forces use mountain passes to move across the Pakistan-Afghanistan border. They use these areas to evade and escape friendly forces and to support their own operations. To help combat these actions, commanders established combat outposts on key terrain that allows control over these areas (see figure 5-11 on page 106).

5-117. Locations for a combat outpost in the mountains are often, but not always, associated with the high ground. Combat outposts may also be positioned where they can influence the civilian population, such as near villages and road networks. High-ground locations can offer all-around visibility and standoff from enemy actions. An appropriate location in the right area, of the right size, clear of debris, rocks, trees, and other vegetation, may be difficult to find and often must be created.

5-118. Topographic surveys can help determine the amount of usable area and the amount of work that needs to be accomplished to prepare a site selected for a combat outpost. Engineer support is often required for the removal of vegetation, rocks, and dirt and to clear, level, and prepare the site for construction. Leaders should

plan for actions against enemy attacks targeted against friendly forces during the actual construction phase of the outpost.

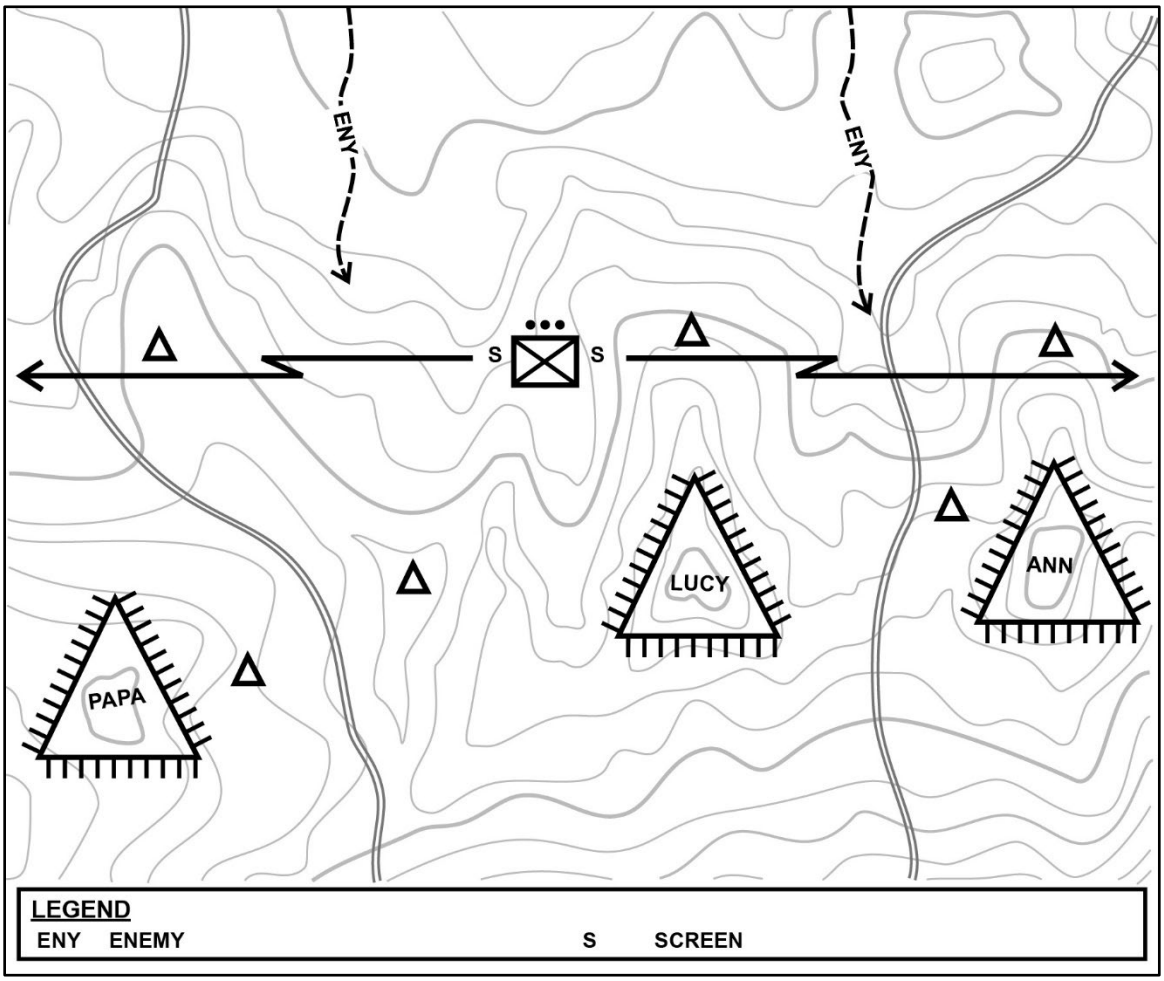


Figure 5-11. Combat outposts

COMBAT OUTPOST OPERATIONS

5-119. There are several factors leaders should consider when establishing and conducting operations from a combat outpost. The site should be in an area that adequately supports its mission and a first priority is establishing all-around security, including patrols, OPs, and security plans during periods of limited visibility. Positions should be selected that provide or can support construction of barriers that provides optimal protection from direct and indirect fires. A position and plan should not be established in such a way that it is vulnerable to bypass, isolation, and subsequent destruction from any direction. Positions should permit observation of enemy avenues of approach and adjacent defensive sectors and if possible, avoid selecting positions that are obvious fire hazards.

5-120. Individual and crew-served weapons positions should plan for mutual support and fields of fire in all directions. If possible, the position should have at least one covered and concealed route that allows for resupply, MEDEVAC, reinforcements, or withdrawal, and protection from direct fire weapons. Positions should include the establishment of primary, preferably inside the position, and alternate LZs. LZs should be clear of dust and rock to the extent possible to prevent brown out conditions. Plans should include the use of infrared beacons or landing lights to aid aircrews in identifying the landing site during night operations and to ensure a safe approach to the ground.

CONSTRUCTION

5-121. Integrated defense plans for mountain-based combat outposts include hardened structures designed to protect personnel and other assets from the effects of enemy direct and indirect fire. To the extent possible, locations in which personnel routinely work, eat, or sleep should be hardened as well as bunkers and foxholes. Overhead cover should be provided in immediate proximity to all unprotected areas in which personnel must work or transit within the combat outpost.

COMBAT OUTPOST STRUCTURES

5-122. During design and construction of a particular combat outpost, leaders consider safety concerns and offensive options for varying structures. Depending on location, construction type, and standoff, however, existing structures can provide protection against munitions.

5-123. Sidewall protection and revetments are walls or barriers designed to stop fragments and reduce blast effects from near-miss impacts of rocket, artillery, and mortar rounds. Compartmentalization provides a series of interconnected walls designed to divide large areas of high occupancy into smaller protected areas to limit casualties from impacts and provide ballistic protection. Overhead cover is a structure designed to provide protection from the direct impact of incoming munitions, while personnel and equipment bunkers are purpose-built structures designed to withstand small-arms and both near miss and direct hits of munitions. Life support contingencies include electrical power, MEDEVAC, medical provisions, hygiene facilities, waste plans, potable water, kitchen and dining area, rest and workout areas, heating and air conditioning, and phones and computers.

5-124. Hardened fighting and observation positions are like personnel and equipment bunkers except they have apertures for returning or initiating fire.

COMMAND AND CONTROL

5-125. The company or platoon command post (CP) for a combat outpost does not normally have a set organization. It consists of the commander or senior leader and other personnel and equipment required for supporting the C2 process and specific mission. The CP locates where the leader determines it can best support the C2 process. For a company-sized combat outpost, the CP often consists of the commander and radiotelephone operators, the fire support team headquarters, and the communications noncommissioned officer (NCO). Others who may locate with the CP include the executive officer (XO), first sergeant (1SG), armorer, reserve element leader, and the leaders of attached or supporting units. CP personnel assist the commander in planning, coordinating, and issuing orders to support their mission. (See ATP 3-21.10 for more on company C2.)

COMMUNICATIONS

5-126. Combat outposts should have communication plans and networks to support their mission. They will often have multiple means and backup means of communication for redundancy. During mountain operations, companies often operate on tactical satellite radios to enhance communication efforts in the restrictive mountain terrain. As a minimum, combat outposts establish communications with higher, lower, adjacent, and supporting units.

Security

5-127. The system should be able to restrict unauthorized monitoring and access to prevent information from being provided to unauthorized personnel. Leaders should ensure that all systems meet guidance from higher commands regarding policies on encryption. Unauthorized personnel should not be allowed access to information over the systems.

Robustness

5-128. The systems should be able to withstand both the natural and man-made interference that may be in the area. The commander should understand the weather effects in the AO (heat, cold, hail, lightning, precipitation, and so on) on radio systems to inform their decision on which system to employ. Man-made factors such as interference created by urban areas, high-tension power lines, commercial radio transmitters,

cell phone towers and interference from radar and directional systems can impede communications and should be identified and factored into the plan prior to system establishment. Additionally, the system should be developed to withstand a single point of failure brought on by enemy attack.

Redundancy

5-129. To be robust, a system should have a duplicate and offer multiple links. Reliance on any single form of communications (for example, radio, telephone, and data) will probably not support the commander's requirements. Every combat outpost should have a minimum of three alternate means of communications. Each should be properly identified as primary, secondary, and tertiary that work as fail-safe systems in the event of a major attack or loss due to weather or interference. These three systems should be separate in type so as not to be impacted by the same event.

Reliability

5-130. Systems should be dependable. Use of commercial communications technology and Department of Defense-provided systems is the norm, but each system and network are researched as to its specific reliability. Systems with low mean time between failure or limited capabilities should not be relied on as key systems. Periodic and thorough maintenance of all systems should be directed and properly conducted to ensure system stability.

Base Defense Plans and Actions

5-131. Bases, including combat outposts, should establish a base defense SOP that outlines the base defense plan. The base defense SOP should be disseminated down to the Soldier level, ensuring that every Soldier understands the part in the base defense plan. Base defense exercises should be conducted regularly to ensure compliance with the SOP. Along with many other details, plans should ensure they have procedures for—

- Establishing a base defense coordination net.
- Passing indications and warning to the unit CP and all personnel on the base.
- Raising force protection condition levels for all Soldiers on base.
- Activating and manning all perimeter supplemental positions.
- Reacting to or stopping a direct attack or perimeter breach by armed personnel.
- Reacting to explosive hazards (for example, an improvised explosive device).
- Reacting to attack from indirect fire or air attack; activating the bunker occupation plan.
- Reacting to or evacuating a casualty.

TUNNELS AND CAVES

5-132. Tunnels, caves, and dry wells have historically been used for hiding places, food and weapons caches, headquarters complexes, and protection against air strikes and artillery fire. Enemy personnel use these areas for both offensive and defensive actions. An extensive tunnel system containing rooms for storage and hiding as well as passages (movement and maneuver) to interconnected fighting points may be encountered. Tunnels and caves are not only a dangerous obstacle but also can be an outstanding source of enemy information. The presence of a tunnel complex within or near an AO poses a continuing threat to all personnel in the area and no area containing tunnel complexes should ever be considered completely cleared. (See ATP 3-21.51 for additional information.)

Tunnel Characteristics

5-133. The first characteristic of a typical tunnel complex is normally superb camouflage. Entrances and exits are commonly concealed, bunkers are camouflaged. Even within the tunnel complex itself, side tunnels may be concealed, trapdoors are often hidden, and dead-end tunnels are used to confuse the attacker. Air shafts are usually spaced at intervals throughout a tunnel system. In many instances, the first indication of a tunnel complex comes from direct fire received from a concealed bunker. Spoil from the tunnel system may be distributed over a wide area, giving clues to its existence.

5-134. Trapdoors may be used, both at entrances and exits and inside the tunnel complex itself, concealing side tunnels and intermediate sections of a main tunnel. In many cases, a trapdoor leads to a change of direction or change of level tunnel, followed by a second trapdoor, a second change of direction, and a third

trapdoor opening again into the main tunnel. Trapdoors may be of several types. They may be concrete covered by dirt, hard packed dirt reinforced by wire, or a "basin" type consisting of a frame filled with dirt. This last type is particularly difficult to locate in that probing may not reveal the presence of the trapdoor unless the outer frame is struck by the probe. Booby traps may be used extensively, both inside and outside entrance and exit trapdoors.

5-135. Tunnel complexes may also be interconnected with other tunnels but concealed by trapdoors or blocked dirt passages that are up to 3 or 4 feet thick. These secret passages are usually known only to selected personnel and are used mainly in emergencies. Tunnels may also be interconnected by much longer passages through which relatively large bodies of people may be transferred from one area to another. The connectivity of these systems often allows the enemy to move unnoticed from one area to another, eluding friendly forces (see figure 5-12).

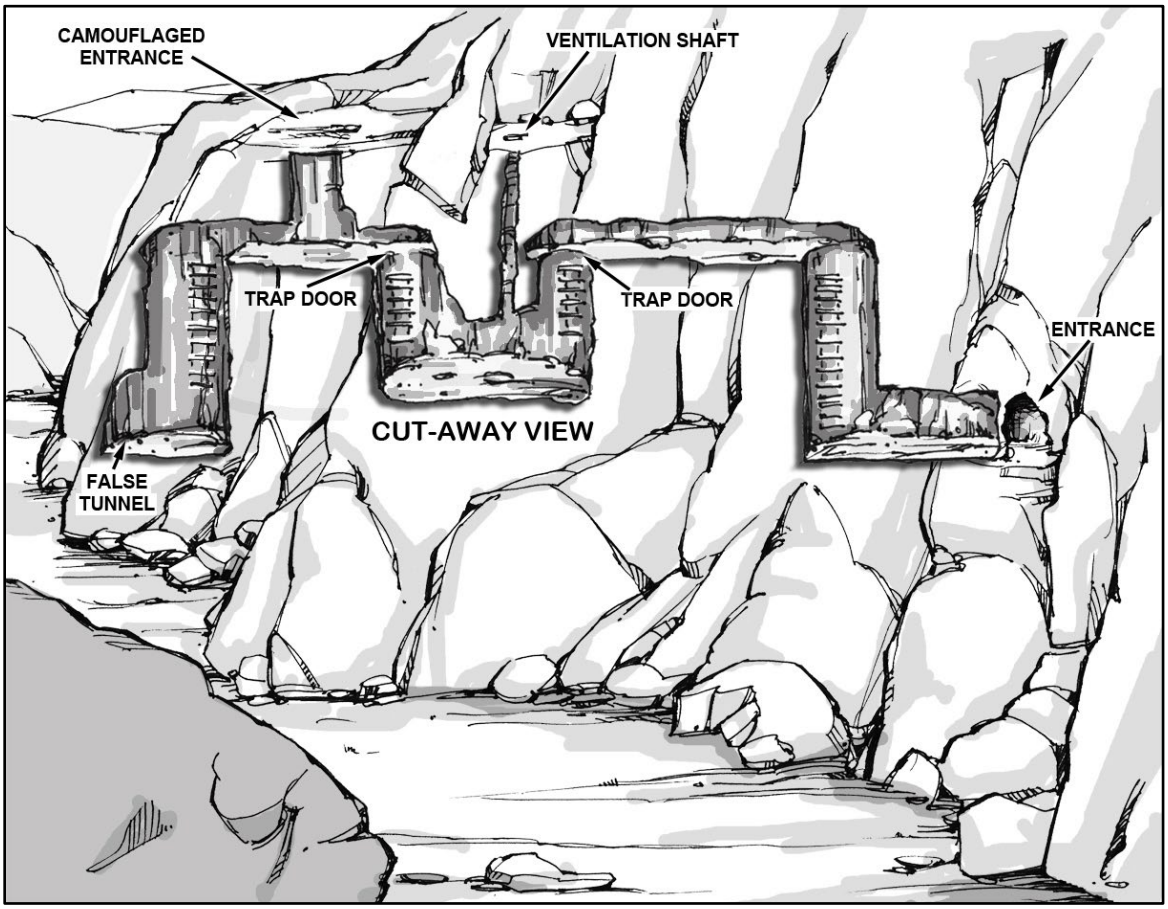


Figure 5-12. Tunnel system

5-136. Since tunnel complexes are carefully concealed and camouflaged, search and destroy operations should provide adequate time for a thorough search of an area to locate all tunnels. The use of local nationals and host-nation scouts can be of great assistance in locating caves, tunnels, defensive positions, and likely ambush sites. Caves, trenches, spider holes, and tunnels are well incorporated into mountain terrain and enemy operations and may be used as a deception to draw friendly forces into a cave or tunnel system rigged with booby traps or set with an ambush.

DANGERS

5-137. The following considerations for dangers inherent in tunnel operations include the presence of mines and booby traps in the entrance or exit area and the possibility of the enemy still in the tunnel who pose a danger to friendly personnel both above and below ground. In some instances, military working dogs (MWDs) may successfully detect the enemy hiding in subterranean environments. (See ATP 3-39.34 for more information on MWD patrol and subterranean capabilities.)

5-138. Biological conditions include the presence of small but dangerous concentrations of carbon monoxide produced by burning type smoke grenades. (Protective masks can prevent inhalation of smoke particles but will not protect against carbon monoxide.) The possible shortage of oxygen as in any confined or poorly ventilated space.

PREPARATION FOR TUNNEL CLEARANCE

5-139. Tunnels and caves are often outstanding sources of information and should be exploited to the maximum extent practicable. Complete exploitation and destruction of tunnel complexes is very time consuming, and operational plans should be made accordingly to ensure success. Commanders may consider the use of thermobaric munitions for destruction of enemy personnel using tunnel systems. Thermobaric munitions are munitions that are intentionally optimized to create heat and pressure and designed to extend the pressure impulse time. These munitions create a cloud of volatile gases or powders which it ignites causing a fireball that consumes oxygen and creates an enormous overpressure. When employed in a tunnel, the blast wave or overpressure is greatly amplified resulting in catastrophic enemy personnel effects. Employment of thermobaric munitions may require coordination with a higher headquarters.

5-140. A trained tunnel exploitation and denial team is essential to tunnel clearance operations. Untrained personnel may miss hidden tunnel entrances and caches, take unnecessary casualties from concealed mines and booby traps, and may not adequately deny the tunnel to future enemy use. Commanders should consider designating specific tunnel teams for clearance operations. Tunnel teams should be trained, equipped, and maintained in a ready status to provide immediate expert assistance when tunnels are discovered.

5-141. Careful mapping of a tunnel complex may reveal other hidden entrances as well as the location of adjacent tunnel complexes and underground defensive systems. Personnel exploring large tunnel complexes should carry a colored smoke grenade to mark the location of additional entrances as they are found. Small caliber pistols are the weapons of choice in tunnels, since large caliber weapons without silencers may collapse sections of the tunnel when fired and damage eardrums. Constant communication between the tunnel and the surface is essential to facilitate tunnel mapping and exploitation. An equipment list for a tunnel team may include (see ATP 3-21.51 for a list of additional equipment):

- Protective mask—one per individual.
- Portable blower—one each.
- TA-1 telephone—two each.
- M7A2 Corson Stoughton grenades—12 each.
- One-half mile field wire on doughnut roll.
- Powdered Corson Stoughton—1-as required.
- Compass—two each.
- Colored smoke grenades—four each.
- Sealed beam 12-volt flashlight—two each.
- Insect repellant and spray—four cans.
- Small caliber pistol with laser sight and white light—two each.
- Technical mountaineering equipment (harness, headlamp)—one each.
- Entrenching tool—two each.
- Probing rods—12 inches and 36 inches.
- Cargo packs on pack board—three each.
- Bayonet—two each.

BASE

5-142. A base is a locality from which operations are projected or supported. Infantry small units require a secure area to prepare for future operations, to recover and refit, and conduct sustainment. Employment of a base uses perimeters and other measures to protect these units during offensive and defensive operations, especially within a noncontiguous assigned area. While supporting primarily stability-focused tasks however, units use a base to protect sustainment operations and provide a secure area to recover from and prepare for operations.

BASE CAMP OPERATIONS

5-143. A *base camp* is an evolving military facility that supports the military operations of a deployed unit and provides the necessary support and services for sustained operations (ATP 3-37.10). Infantry small units use base camps to provide a protected location from which to project and sustain combat power. Operating from base camps is a fundamental mountain tactic of ground-based forces while conducting primarily missions, tasks, and activities to stabilize an operational environment. The level of protection afforded by a base camp is based on the threat.

5-144. In base defense operations, a *base cluster* is a collection of bases, geographically grouped for mutual protection and ease of command and control (JP 3-10). Units located within a base camp are under the tactical control of the base camp for base security and defense. Within large echelon support areas, controlling commanders may designate base clusters for mutual protection and accomplishment of mission objectives.

5-145. Each base camp is unique, based on mission requirements and the theater-specific facility allowances and construction standards that apply. Base camps are developed to serve a specific purpose such as to serve as an intermediate staging base, a forward operating base, or a logistic base; support reception, staging, onward movement, integration, training, and detention operations; or they may be multifunctional. The designated purpose and the operational requirements of tenant units serve as the primary guide in designing the base camp.

5-146. A base camp can contain one or more units from one or more services and will typically support both U.S. and multinational forces, as well as other unified action or inter-organizational partners operating anywhere along the range of military operations. A base camp must be viewed through a life cycle construct that includes the development of base camps from pre-establishment through transfer or closure, with levels of increasing base camp capabilities. (See ATP 3-21.20 and ATP 3-37.10 for additional information on base camp operations.)

BASE CAMP SECURITY

5-147. A primary task of base camps is to protect the combat power of the units assigned to it. Ensuring that base camps provide the necessary protection requires an application of the protection tasks that are detailed in ADP 3-37. Base camps will typically protect their personnel and assets through application of area security. *Area security* is a type of security operation conducted to protect friendly forces, lines of communications, installation routes and actions within a specific area (FM 3-90). Operations in noncontiguous assigned areas require commanders to emphasize area security. Area security operations focus on the protected force, installation, route, or area. (See ATP 3-21.10, chapter 4, section III for information on area security operations.)

BASE CAMP DEFENSE

5-148. Base camp defense is based on the characteristics of the defense discussed in ATP 3-21.20 and ATP 3-21.10. One of the key characteristics, and one that is difficult for a base camp to achieve, is depth. The base camp commander uses a variety of techniques to increase the time a threat has to take to achieve a penetration and the exposure to friendly fires. These can include—

- Patrolling outside the perimeter.
- Wire, concrete, or other barriers used to reinforce the perimeter.
- Entry control points and associated obstacle and countermobility plans used to canalize and control incoming personnel or vehicles.

- Barriers employed to block high-speed avenues of approach, both externally on approaches to the perimeter and internally to protect high-risk targets.
- Perimeter guard towers and OPs.

5-149. Ditches, berms, or other earthen obstacles. Base camp defense includes the activities needed to defeat level I and level II threats to a base camp or base cluster. Base camp defense shapes or delays level III threats. A *tactical combat force* is a rapidly deployable, air-ground, mobile combat unit with appropriate combat support and combat service support assets assigned to, and capable of, defeating Level III threats, including combined arms (JP 3-10) or other available response forces that are part of the higher commander's area security efforts to defeat level III threats (Army uses sustainment instead of combat service support). (See ATP 3-21.20 for a detailed discussion.)

5-150. The three levels of threat categories are—

- *Level I threat*—a small enemy force that can be defeated by those units normally operating in the echelon support area or by the perimeter defenses established by friendly bases and base clusters (ATP 3-91).
- *Level II threat*—an enemy force or activities that can be defeated by a base or base cluster's defensive capabilities when augmented by a response force (ATP 3-91).
- *Level III threat*—an enemy force or activities beyond the defensive capability of both the base and base cluster and any local reserve or response force (ATP 3-91).

5-151. In most cases, commanders employ base camps in locations where the area commander effectively mitigated or eliminated the risk of a level III threat; however, base camps often become focal points for hostile actions. Because of the uncertainty in contingency operations and the acknowledgement of hybrid threats, base camp commanders must be prepared to conduct defensive operations to repel a level III attack when the threat assessment indicates the possibility of a level III threat in the AO, regardless of which element (offense, defense, or stability) of warfare or simultaneous activities is currently dominant. This may involve significant increases in area denial measures; offensive actions; hardening, dispersal, and other protection measures; and immediate reaction to hostile actions. While hardening of facilities and maintaining a response force is the responsibility of the base camp commander, area denial actions (see ATP 3-21.20) and offensive operations to reduce the risks of level III threats are the responsibility of the area commander.

BASE CAMP CHARACTERISTICS

5-152. Base camps are designed and constructed to be resistant to attack and recover quickly after an attack so that they can continue to operate. The ability to recover quickly from an attack is enhanced through detailed planning and rehearsals of procedures. Base camps must be prepared to defend in any direction through flexible base defense plans, including the use of dedicated response forces positioned to respond to the widest possible range of contingencies. Base camp commanders apply the principles of protection described in ADP 3-37 as well as the fundamentals of security and characteristics of defense identified in ATP 3-21.20 and FM 3-96 in preparing base camp defense plans.

5-153. Base camps are vulnerable to indirect fires because of the concentration of forces within a small area. The base camp commander mitigates this threat by dispersal, use of protected buildings and barriers, and active counterbattery techniques.

SECTION II – DISMOUNTED MOVEMENT CONSIDERATIONS

5-154. *Dismounted movement* is a movement of troops and equipment mainly by foot, with limited support by vehicles (FM 3-90). Dismounted movements, also called foot marches, are characterized by combat readiness, ease of control, adaptability to terrain, slow rate of movement, and increased personnel fatigue. Dismounted movements do not depend on existence of roads. (See ATP 3-21.18 for additional information on foot marches.)

MARCH MISSION

5-155. In mountain and cold weather environments, as in other environments, commanders use tactical road marches and approach marches to relocate units within an AO to conduct combat operations. Commanders

use tactical road marches when contact with the enemy is not expected; and approach marches when contact is intended. Organization of forces, in mountain and cold weather operations, for the march must be flexible to the changing conditions within an environment and responsive to the commander.

5-156. Prior to the mission, the commander determines the amount and type of equipment carried and rate of march. The length and number of rests equates with a unit or Soldiers' physical endurance. Detailed planning and leaders must move Soldiers and equipment to the right place at the right time ready for combat. Commanders ensure Soldiers arrive in good condition to accomplish their mission. March units should be notified of an impending move early enough to allow for planning.

5-157. A successful march culminates when Soldiers arrive at their destination at the prescribed time and are physically and mentally able to execute their mission immediately. Physical and mental conditioning is normally done through unit conditioning programs and acclimatization of Soldiers to an AO. Dismounted movement depends on C2 through the chain of command by proper supervision and organization of units. Movement of Soldiers over extended distances has extensive sustainment considerations.

5-158. When necessary and when mountainous and cold weather conditions allow, foot marches can be hurried by conducting a forced march. Forced marches require speed, exertion, and more hours marched per day. This is normally accomplished by increasing marching hours for each day rather than rate of march. Forced marches are employed only when absolutely needed since they decrease unit effectiveness.

5-159. Shuttle marches alternate riding in vehicles and movement by foot during dismounted movements. This is normally due to an insufficient number of vehicles to carry the entire unit. Shuttling requires transporting Soldiers, equipment, and supplies by a series of round trips with the same or different vehicles. It can be performed by hauling a load an entire distance then returning for another. It may be performed by carrying successive elements of loads for short distances while remaining elements continue on foot.

PLANNING FOR THE MARCH

5-160. March unit task organization, mission statement, commander's intent, concept of operations, tasks to subordinate units, coordinating instructions, and control measures are key components in planning a march. Commanders, as in all operations, ensure their mission and end state nest with those of their higher headquarters. While commander's intent focuses on the end state, the concept of operations focuses on ways or sequences of action by which forces achieve the end state—arrival at their destination at the prescribed time, physically and mentally able to execute follow-on mission(s).

ENVIRONMENTAL CONSIDERATIONS

5-161. Environmental considerations must be taken into account when planning foot movement during the march. Key environmental considerations during movement planning are addressed in paragraphs 5-162 through 5-173.

Mountainous Areas

5-162. Steep grades are common in mountainous areas. Proper selection of formations for an operation enables continued movement without halting. Soldiers must always be extremely careful in vicinity of sharp curves and dangerous grades. Uphill or downhill grades should be traversed carefully. When entering short, steep grades, Soldiers may build up momentum on the approach, so the added momentum carries them over it. Use caution to ensure safety.

5-163. Units moving in column (or file) must guard against bunching on approaches to grades and curves. The slow movement of columns in mountainous areas makes Soldiers vulnerable to an enemy attack at natural obstacles or canalizing terrain. Throughout planning, specifically during wargaming, commanders consider actions on contact along primary, alternate, and contingence routes.

Water Obstacles

5-164. Evidence of ground water, such as the presence of springs, pools, or plant growth, along a planned cross-country route presents problems during the movement of Soldiers. Water obstacles generally are associated with valleys or lowlands. However, side hill bogs and ridgeline swampy ground may appear where

ground water emerges. For planning purposes, consider these barriers as seasonal, although seasonal conditions affect them as the water table rises or falls. Timely estimation of size and characteristics of obstacles through map study, reconnaissance, surveillance, and intelligence operations aid in determining—

- Amount and type of added equipment needed to facilitate passage of a column.
- Probable delays and adjustments in schedule to avoid congestion.
- Advisability of using an alternate route to bypass obstacles.

Ditches and Streams

5-165. Drainage ditches and canals, gullies and ravines, and streams and rivers present obstacles to foot movement especially if obstacles are large and movement is open to enemy action. A map study, R&S missions, and intelligence operations supply the information necessary to plan movements under these conditions.

5-166. An engineer reconnaissance mission can determine requirements for crossing an obstacle. For example, small ditches, gullies, and streams do not normally cause serious delays, though a unit's approach and passage may be at a reduced speed and require more control to avoid congestion. Canals, ravines, and rivers present serious obstacles to foot movement and require assistance for crossing.

5-167. Bridges and fords offer likely targets for enemy artillery, sniper, ambush, and explosive hazard activities. Therefore, no foot movement without provision for changes in plans dictated by current intelligence.

5-168. In general, canals, ravines, and rivers crossing selected routes require added preparation by planners. Planners do this to—

- Avoid congestion in critical areas.
- Arrange for construction at crossing sites.
- Give adequate instructions to personnel to ensure proper conduct of missions.

Arctic Areas and Northern Temperate Zone

5-169. Commanders plan for movements in arctic areas and northern temperate zones based on a thorough familiarity with local weather and terrain. Movement plans must account for maximum severity of seasonal weather and be flexible to allow for sudden weather changes.

5-170. Sudden rise in temperature accompanied by warm rain turns trafficable snow into mud and slush. Cold temperatures, even though above freezing, cause great discomfort to personnel. Midwinter thaws are often followed by subzero temperatures, creating deep frozen ruts and ice.

5-171. If vehicles are attached, snow and ice accumulation may bind moving parts and wheels and lead to accidents. Sudden changes in weather often have detrimental effects on vehicle transport operations. Advance planning and preparation must include the following:

- Winterizing vehicles to meet severe weather conditions when applicable.
- Instructing personnel in winter hygiene and first aid.
- Issuing suitable cold weather clothing and equipment.
- Requesting engineer personnel and equipment, when necessary, expediting movement.

5-172. Route selection is based on data resulting from route and area reconnaissance. Alternate routes are identified to take advantage of changes in trafficability due to weather. Despite reduced pace, column (sometimes called file) formations normally are open due to intervals required for increased distances. During periods of low visibility, columns close to maintain control. Commanders and subordinate leaders schedule frequent halts to allow Soldiers to rest and adjust their loads.

Urban Areas

5-173. Urban areas all over the world share many general characteristics. These characteristics include dense city centers, compartmentalization, sectionalism, infrastructure, mass transportation lines, varied street patterns, and continual modernization. Central to a large majority of the indigenous population in mountain environments are rural people such as farmers and animal herders that live mostly in small villages in the

valleys. Units in contact with indigenous populations in mountain environments identify and consider the boundaries of the politics internal to political units within this environment during planning on a case-by-case-basis. Commanders and subordinate leaders analyze civil considerations (see ATP 2-01.3) that include areas, structures, capabilities, organizations, people, and events (also called ASCOPE). These characteristics easily align with an urban area's three main components of terrain, society, and infrastructure; and, like them, they are overlapped and interdependent. (See ATP 3-06.11 for additional information.)

Note. Subsurface, or subterranean, areas include underground facilities, passages, subway lines, utility tunnels, caves, sewers, and storm drains. Although these areas allow for tactical movement, a commander will generally not conduct a foot movement in these areas. (See ATP 3-21.51 for information on subterranean operations.)

MARCH DISTANCE, RATE, AND TIME

5-174. Basic factors of march distance, rate, and time transform into movement formulas. Commanders and subordinate leaders apply formulas to known data to obtain information needed to prepare a time schedule. The time schedule is used to regulate departures and arrivals of march elements.

5-175. Relationships between time and distance are the basis for march planning. Commanders and subordinate leaders determine how far columns should travel (distance) and how long it takes to make the move (time). They must know the space (length of column) columns occupy on the route. They include in their computation safety factors of distance (road gap) or time (time gap) separating march columns and their elements. Each term used for distance has its corresponding term for time. The length of a column in kilometers has an equivalent travel time in minutes; road distance in kilometers or miles has a corresponding time distance. (See ATP 3-21.18 for a detailed discussion.)

5-176. Movement rates, coupled with proper Soldier spacing, adjust to prevent an accordion effect during movement in adverse terrain. Spacing between Soldiers largely depends on the terrain, weather, and visibility. In adverse terrain, a slow, steady pace is preferred to rapid movement with frequent halts. (See paragraph 5-30 for information on dismounted movement rates for mountain environments.)

STRAGGLER CONTROL

5-177. Stragglers who cannot meet or maintain the pace set for the foot movement are the responsibility of their immediate chains of command. Leaders may redistribute a Soldier's load to other unit members to enable a Soldier to meet or maintain the pace. Fire team leaders, squad leaders, and ultimately the platoon sergeant must ensure Soldiers that cannot maintain the pace for the movement are linked up with the straggler control party (when established) at the rear of the march column or evacuated to a secure area or base.

5-178. Information concerning the number of Soldiers who fall out, their standard name lines, and medical disposition must be relayed through the chain of command to maintain accountability of personnel and equipment at all times.

Note. Soldiers who fall out and are carrying mission-essential equipment must transfer equipment to other Soldiers in the unit continuing the march according to unit SOP.

PREPARATIONS FOR THE MARCH

5-179. Preparation is essential to effective execution of any movement plan. Preparing before actual events gives commanders, subordinate leaders, and Soldiers clear ideas of what to expect. Applicable unit SOPs enable execution. This section addresses key preparation activities for the march. (See ATP 3-21.10 for additional information on preparation activities.)

MARCH REHEARSALS

5-180. Well-planned rehearsals are critical aspects of preparation for march operations. With limited time, rehearsals must concentrate on battle drill reactions to likely enemy threats. Rehearsals ensure everyone in

the march understands and demonstrates the ability to execute the plan and essential drills. Rehearsals instill confidence in all march participants and ensure they are fully prepared.

5-181. Good rehearsals happen when carefully planned and prepared. Subordinate leaders supervise individual and crew drills rehearsals. Leaders schedule rehearsals early in the preparation cycle, linking individual and crew rehearsals with precombat checks (PCCs) and precombat inspections (PCIs). Leaders and Soldiers practice drills until individuals, teams, and crews can executed appropriate actions to standard. On-the-spot corrections made during rehearsals and throughout preparation activities help to ensure success.

Precombat Checks and Precombat Inspections

5-182. PCCs determine if equipment required for the march is available and serviceable. These checks are effective when organized and conducted, using an up-to-date checklist. Unit SOPs tailor these lists to specific missions. Follow-through is essential, unit members report, repair, or exchange missing or unserviceable equipment immediately. Leaders start conducting these checks soon after the commander or subordinate leader issues the warning order.

5-183. PCIs are a series of inspections scheduled early in the preparation sequence to ensure all PCCs have been performed properly and all weapons, communications, vehicles (when required), and special and individual equipment are available and functioning. PCIs are effective when organized and conducted to exacting standards by first-line supervisors, with systematic spot checks made by subordinate leaders. An effective technique is conducting full PCC and PCI during the march recovery period to ensure individuals and unit equipment are immediately ready for the next mission. (See ATP 3-21.8 for additional information.)

Equipment Maintenance

5-184. Commanders and subordinate leaders plan for regular maintenance prior to movement and during halts throughout extended marches. Weapons, night vision devices, optical equipment, and vehicles require regular maintenance to perform consistently throughout operations. Weapons and other equipment including vehicles can become nonmission capable due to direct or indirect enemy fire, mines, explosive hazard, vehicle accidents, parts failures, and other unforeseen or unexpected events.

5-185. Commanders and subordinate leaders enforce regular preventive maintenance checks and services (PMCS) of all unit equipment. PMCS is operator-level maintenance conducted before, during, and after operations. Comprehensive PMCS identifies actual and potential problems and ensures repairs are made promptly to minimize equipment downtime. DA Form 5988-E (*Equipment Maintenance and Inspection Worksheet*) or the manual DA Form 2404 (*Equipment Inspection and Maintenance Worksheet*) is used to record these deficiencies.

5-186. Early detection and correction of these deficiencies can decrease the possibility of combat equipment breaking down during marches and prevent minor deficiencies from becoming major faults. Every individual is responsible to conduct PMCS. Subordinate leaders are responsible to ensure Soldiers conduct PMCS regularly and to standard before, during, and after the operations. (See ATP 3-21.8 for additional information.)

MARCH EXECUTION

5-187. The execution phase is a continuation of the planning and preparation phases. The operations process provides a framework for feedback to unit commanders or subordinate leaders. Proper planning and preparation ensure smooth transitions by setting up task organization, C2, and security measures. Commanders enhance execution during mountain and cold weather operations by enabling and adapting plans to changing situations and conditions. The following paragraphs address situations, conditions, and activities unique to the march.

Limited Visibility Marches

5-188. Limited visibility marches are characterized by close formations, difficult control and reconnaissance, and a slower rate of march. Units routinely operate during limited visibility and must be prepared to maneuver against an enemy under all conditions. During limited visibility, increases in control and risk reduction measures enable the march.

5-189. Prior to tactical movement, the commander is briefed on the effects of terrain, weather, and other intelligence products on the proposed march route. The commander conducts mission analysis to determine the control, navigation, and security measures required to conduct the movement under limited visibility conditions.

5-190. When visibility is poor, several methods aid in control during movement:
- Leaders move closer to the front.
- Units reduce speed.
- Units use luminescent tape on personnel and equipment.
- Leaders reduce intervals between Soldiers and units.
- Leaders conduct headcounts often.

5-191. While navigating during limited visibility, units use the same techniques as during daylight, but leaders exercise more care to keep the unit oriented. Leaders must be able to control and navigate the unit to maintain security and movement during limited visibility.

5-192. As with any operation, leaders consider which security measures to employ and when to employ them to mitigate risk, such as—
- Enforcing strict noise and light discipline.
- Using radio silence when possible.
- Using camouflage.
- Using terrain to avoid detection by enemy surveillance or night vision devices.
- Making frequent listening halts; conduct stop, look, listen, and smell.
- Masking sounds of movement, when possible, such as rain, wind, and flowing water mask sounds of movement.

5-193. Disadvantages during a march under limited visibility may include—
- Difficulty in navigation.
- Slower rate of march.
- Difficulty in recognizing checkpoints.
- Difficulty in controlling subordinate units.
- Difficulty in maintaining proper interval between units.
- Aviation support may be reduced.
- Difficulty in reacting to enemy contact.
- Difficulty with MEDEVAC and CASEVAC.
- Ineffective unmanned aircraft system (UAS) coverage.

5-194. Advantages during a march under limited visibility may include—
- Increased security.
- Tighter formations.
- Less traffic at night.
- Use of surprise and stealth.
- Better concealment.
- Reduced rate of march.
- Cooler during hot and humid conditions.

5-195. Control is increased by reducing distances between Soldiers and units. The number of guides can be increased, depending on suitability of roads, trails or the mission variables of METT-TC (I). Consistent with light discipline, visual communication means such as flashlights, lanterns, luminous markers, lasers, and pyrotechnics are used. Unit SOP should reflect increased control measures when movement is conducted during limited visibility. Items may include—
- Assigning colors to march units, used on flashlights, strobe lights or other lighting means for recognition.
- Closing intervals between elements of the column (or file).
- Increasing use of connecting files between march units in the serial.
- Monitoring radios closely.
- Increased radio traffic occurs during limited visibility.

RISK REDUCTION MEASURES

5-196. Depending on the mission variables of METT-TC (I) or unit SOP, limited visibility marches may require risk reduction measures. Measures include using trails or routes not used by vehicles and placing guards to the front and rear of columns and on flanks when vehicles could approach from those directions. Ensure road guards are equipped, marked, and informed of the enemy situation.

5-197. If the tactical situation permits, mark moving or static traffic guards and other key personnel with reflective or luminescent materials such as reflective fabric or tape, vests, caps, mittens, helmet bands, and traffic ensembles. Warn vehicle operators of the presence of Soldiers on or near the roadway, limiting speeds as needed and if mission requirements allow, ensure vehicles use limited visibility lights. Provide exclusive use of selected routes by foot Soldiers and enforce safety measures when Soldiers are assigned exclusive use of routes that are negotiable by wheeled or tracked vehicles.

5-198. Unit SOPs or mission requirements dictate ammunition-to-tracer ratio.

SOLDIER AND LEADER ENGAGEMENT

5-199. Foot marches occur under conditions and in environments in which people live, increasing the likelihood of interactions with indigenous populations. Soldier and leader engagement are an information related capability at every unit's disposal that seeks to ensure these interactions shape the current situation favorably and support the commander's intent. More specifically, these interactions—

- Enable Soldiers to obtain combat information of immediate value.
- Build rapport, trust, and understanding with the populace.
- Increase understanding and situational awareness of the immediate surroundings.

5-200. Soldier and leader engagements require clear guidance in the form of SOPs on ways to interact effectively with the local populace, as well as thorough planning and preparation. For example, an important element of planning is determining whether an interpreter is required for the foot march. Preparation involves rehearsing Soldier and leader engagements using realistic and probable scenarios that the foot march may encounter. (See FM 3-53 for additional information.)

SECURITY

5-201. During the march, units maintain security through observation, orientation, dispersion, concealment, and camouflage. Leaders assign sectors of observation and orientation to Soldiers to create 360 degrees of coverage. Throughout the movement, elements are oriented on specific sectors. Lead elements of a march unit cover the front, following elements cover alternate flanks, and the last elements cover the rear.

Air and Missile Defense

5-202. The commander ensures all passive and active air defense measures are well-planned and implemented. Passive measures include use of concealed routes and assembly areas, movement on secure routes, marches at night, increased intervals between elements of the columns, and dispersion. Active measures include use of organic and attached weapons according to the movement order or operation order and unit SOP.

5-203. Subordinate leaders assign air guard duties to specific Soldiers during the march with leaders giving each a specific search area. For both dismounted and mounted movements, seeing the enemy first gives the march unit time to react. Leaders understand that scanning for long periods decreases the Soldier's ability to rapidly identify enemy aircraft. During extended or long marches, Soldiers are assigned air guard duties in shifts. (See chapter 6, section V for additional information on air and missile defense.)

Halts

5-204. During extended marches, halts are necessary to rest personnel, adjust movement schedules, reorganize march elements, and if applicable service vehicles. The movement order or operation order or unit SOP regulates when to take halts and addresses actions for various types of scheduled and unscheduled halts for security, rest, and maintenance. During halts, march elements normally clear the march route and move

to a previously selected assembly area to prevent route congestion and to avoid being a lucrative target. March elements establish local security and take additional measures, as required, to protect the force.

Scheduled Halts

5-205. The commander schedules halts generally with all units in the column halted at the same time. Preplanned halts along march routes are scheduled for maintenance and rest, or to follow higher headquarters' movement order. A scheduled halt is located on concealed and defensible terrain. During scheduled halts, Soldiers move off to the sides of the road while maintaining march dispersion. Units establish local security immediately, including at least one OP for each platoon. Leaders establish OPs within small-arms range that are readily retrievable, so the unit is ready to move at a moment's notice.

5-206. Extended marches during daylight hours should end early enough to provide Soldiers with rest and time to prepare for next day's activities. Midday heat or enemy action can require units to make long day halts or night marches. At long halts, each unit moves to a planned location near the march route and follows guidelines given in the movement order or operation order or unit SOP. Leaders inspect Soldiers and equipment during halts, and medics or combat lifesavers administer medical treatment to those who need it. Regardless of what happens, units maintain all-around security.

5-207. Under normal conditions, a 15-minute halt provides an opportunity for Soldiers to adjust loads after the first 45 minutes of marching. Depending on the situation, following the first halt, the commander may establish a 10-minute halt for every 50 minutes of marching. The commander, in conjunction with higher headquarters, determines when halts are required based on terrain, enemy contact, and combat effectiveness due to fatigue. Variations of time schedules are required if a halt occurs when passing through built-up areas, or when cover and concealment are required but not available. Leaders keep variations in the time schedules to a minimum if possible.

Note. Depending on the situation, at the halfway point through an extended march, a 15-minute stop may be taken in which all Soldiers alternate changing socks and powdering feet. Soldiers may also alternate removing or loosening gear and sitting or lying down with their feet elevated.

Unscheduled Halts

5-208. Unscheduled halts may be caused by unforeseen actions or developments such as obstacles, traffic congestion, or equipment failure. If the halt is for a limited timeframe, the march column's initial priority is to establish local security. Short halts typically take one or two minutes. Soldiers seek immediate cover and concealment and take a knee. Long halts typically take more than 2 minutes. Soldiers assume prone positions behind cover and concealment. Leaders ensure Soldiers have clear fields of fire and assign sectors of fire. When an extended halt is anticipated, the march column establishes a hasty perimeter defense.

Obstacles

5-209. If possible, obstacles reported by reconnaissance, or another forward element are bypassed. If an obstacle cannot be bypassed, the lead march unit assumes a hasty defense to provide overwatch while the obstacle is reduced. Follow-on march units move slower or move off the road establishing a hasty perimeter with 360-degree security, then closely monitors the command net for further orders.

Overwatch

5-210. Commanders and subordinate leaders identify overwatch positions during the intelligence preparation of the operational environment (IPOE) process. Key terrain identified to provide overwatch, often located at higher elevation, enable security through areas of possible enemy contact. To compensate for increased vulnerability of compressed formations, units make maximum use of multiple routes (when possible) coupled with the security provided by an overwatching element. Overwatch elements provide security from potential ambushes along routes whenever possible and when danger to the march is imminent. Return march routes, when utilized, are varied, when possible, to increase security, this includes the movement of the overwatch element.

SCHEME OF FIRES

5-211. *Scheme of fires* is the detailed, logical sequence of targets and fire support events to find and engage targets to support the commander's objectives (JP 3-09). The march commander and subordinate leaders integrate and synchronize indirect fires, Army attack aviation (manned and unmanned) and/or organic or tasked echelon specific UAS firing platforms, and close air support (CAS) to support the march. The march commander ensures targets and fire support events are planned for each march unit to counter likely enemy obstacles and ambushes and support planned engagement areas (EAs). Depending on what other mission is being supported, the march column or serial may not have priority of fires during movement. Commanders and subordinate leaders always plan for internal fire support regardless of external fire support. They rehearse the scheme of fires to ensure coverage throughout the movement.

UNMANNED AIRCRAFT SYSTEM EMPLOYMENT

5-212. When feasible, echelon-specific UAS employment provides an information collection (specifically R&S) capability prior to the march. UAS employment enables situational awareness during the march and can monitor and track movement in areas of key interest. Commanders use a UAS prior to and during the march—

- To gain knowledge on known or suspected enemy locations.
- To reconnoiter an area, route, or zone.
- To observe or monitor otherwise unobservable areas (such as defilade, cracks, crevices, and other concealed areas).
- To provide security and fires (echelon-specific UAS [to include firing] platform).
- Support security for OPs, combat outposts, raids, and patrols.
- To disrupt enemy radio communications.
- To deceive or divert the enemy through tactical deception.

5-213. UAS capabilities from higher echelons may be available for battalion-level and below operations, though coordination is generally required well in advance. Often these systems are used for preplanned operations rather than opportunity type missions and require 72-to-96-hour pre-coordination. The employment of the echelon-specific UAS platforms, (for example, organic or tasked to the Infantry rifle company), depends on the situation. Employment advantages and disadvantages at each echelon, as with any capability, determine the system's employment.

5-214. Conditions affecting UAS employment include rain, fog, snow, wind, and other weather-related situations. These systems are easily detected and are prone to interference from enemy jamming. When other aviation assets are operating in the area, ground forces must alert aerial platforms controllers to the current location and altitude of tactically operated UASs. Coordination and communication with higher headquarters ensure aircrews are alerted to airspace restrictions as they arise for UAS use.

5-215. In mountainous terrain, where weather conditions can vary abruptly and easily crash a UAS, commanders may decide risk of loss is too great to warrant their employment. Depending on mission requirements, downed systems may have to be recovered. The recovery of a downed UAS in adverse terrain can be slow and arduous and expose recovery teams to enemy actions. (See ATP 3-04.1 for additional information.)

SCHEME OF ENGINEER OPERATIONS

5-216. Engineers review the movement order or operation order to assist in conveying the scheme of engineer operations required to support the march. Engineering tasks prior to the march effectively address classification of the route and provides information useful in the engineer estimate conducted at battalion. Similarly, the engineer estimate effectively addresses efforts to provide information useful in classification of the route. (See FM 3-34 and ATP 3-34.22 for additional information.)

5-217. Geospatial engineering is focused on improving the march commanders understanding of the terrain the route is over. Geospatial engineering is the foundation that supports the combat and general engineering and the lines of engineer support for the march. Geospatial engineering teams can provide information on soil conditions, vegetative concealment, and terrain masking along march routes to facilitate movement and the survivability of the force. (See ATP 3-34.80 for additional information.)

5-218. Engineer reconnaissance includes both tactical and technical engineer support to the march. Engineer reconnaissance, like chemical, biological, radiological, or nuclear (CBRN) and other technical applications, is the focused application of special or unique capabilities supporting reconnaissance operations and is applicable over or pertinent to the march. Engineer reconnaissance generated from and organized by engineer lines of efforts provides a range of technical reconnaissance capabilities. Each line supports varying degrees of technical expertise and efforts to the march. (See ATP 3-34.81 for additional information.)

EN ROUTE SUSTAINMENT

5-219. Based on the march method and route used, the commander may have to preposition sustainment assets to conduct rapid and efficient resupply and maintenance. Generally, a column (or file) formation is the easiest march technique to support. Any other formation requires increased sustainment planning. Movements during limited visibility require special preparations to include marking units, Soldiers, and equipment for easy identification by friendly forces, and positioning units and Soldiers closer together. The march commander can relieve sustainment shortfalls by using aerial resupply or ordering external forces to establish support areas along the route when feasible.

SECTION III – SOLDIER LOAD CONSIDERATIONS

5-220. Soldier load is an area of concern for Infantry commanders and subordinate leaders. How much is carried, how far, and in what configuration are especially critical mission considerations in operational environments characterized by high altitudes, rapidly changing climatic conditions, and rugged terrain. Commanders balance the risk to Soldiers from the enemy against the risk to mission accomplishment due to excessive loads and Soldier exhaustion and injury. Soldier load is limited to mission-essential equipment to sustain continuous operations. Commanders accept prudent risks to reduce Soldier load based on a thorough mission analysis. This chapter addresses considerations specific to Soldier load, the tailoring of loads, and decisions to reduce risk.

ECHELONING LOADS

5-221. The ability of Soldiers to march and fight is directly influenced by their combat load in any environment. Excessive loads significantly reduce the Soldier's ability to accomplish the mission. Echeloning loads and identifying the optimum combat load for the Soldier is crucial to maintaining combat power and ensuring efficient mission accomplishment. Infantry small-unit leaders tailor loads based on mission requirements and environmental conditions and manage risk throughout all phases of the mission.

5-222. Commanders and subordinate leaders resist the mindset to carry everything to be prepared for every eventuality. Subordinate leaders at the lowest levels enforce load discipline to ensure that Soldiers do not voluntarily carry excess weight. Commanders plan for the delivery of nonessential equipment forward for subsequent operations. (See ATP 3-21.18, chapter 3, section I for additional information on echeloning loads.) Echeloning loads to be secured or transported, breaks down supplies and equipment into three echelons: combat load, sustainment load, and contingency load.

COMBAT LOAD

5-223. Combat load is the minimum mission-essential equipment required for a Soldier to operate (fight if required) and survive (specific to environmental conditions) during the immediate operation. Supplies and equipment not carried in a combat load are secured and transported in sustainment loads (see paragraph 5-227), and contingency loads (see paragraph 5-228). Soldiers carry loads in one of three type combat loads depending on the situation. The three types of combat loads are fighting load, approach march load, and emergency approach march load.

Fighting Load

5-224. Fighting load is the essential items a Soldier needs to maneuver on, close with, and destroy enemy forces in direct fire contact. Fighting load is the sum of everything worn or carried by the Soldier. For missions requiring mobility, speed, and stealth, carrying heavy loads is a disadvantage. Cross-loading machine gun ammunition, mortar rounds, shoulder fired munitions, water, and radiotelephone operator's

equipment across the unit may be necessary to balance out the loads being carried within the unit. For example, selected Infantry rifle platoon members may carry a mortar round (usually addressed in unit SOP) to drop at the mortar firing position once the unit reaches its AO to reduce loads within the mortar section.

Approach March Load

5-225. An approach march load consists of the fighting load plus additional essential equipment. The approach march load may include an assault pack or rucksack and all other items not needed in the fighting load and now required. Approach march loads, where direct contact with the enemy is intended, are dropped in an assault position, objective rally point, or when receiving effective enemy fires prior to an assault. (The key word is effective enemy fires, not contact, dropping carried loads will always delay the operation during recovery of dropped gear or equipment.) Execution of this technique must be planned for and rehearsed, and may require transportation assets, when available, to retrieve equipment later in the operation. An approach march load allows Soldiers to fight and sustain themselves until resupplied, though, approach march loads should not exceed 100 pounds.

Note. Depending on the mission and environmental conditions, items carried normally in an approach march load may be carried as a fighting load. For example, wet weather gear top and bottom, and additional water, meals ready to eat, and ammunition.

Emergency Approach March Load

5-226. Operations requiring an emergency approach march load should only be used when necessary to accomplish a specific mission. For example, Soldiers may be required to carry heavier loads through terrain impassable by vehicles or when ground and air transportation resources are unavailable. Excessive weights associated with these loads significantly impact the unit's ability to move to the final destination without physically exhausting Soldiers. Physical exhaustion significantly limits the cognitive ability and mental focus of leaders and Soldiers and inhibits their combat effectiveness. When carrying an emergency approach march load, commanders should seek to limit march distances and provide Soldiers time to recover before executing follow-on activities.

Sustainment Load

5-227. Sustainment loads consist of equipment required to sustain operations. Sustainment loads are generally positioned within the battalion or company support area and brought forward when needed. Sustainment loads may include rucksacks, duffel bags, and sleeping bags. Depending on the situation, personal protection items can be stored in preconfigured unit sustainment loads. Coordination is made to ensure sustainment load items are available when required.

Contingency Load

5-228. Contingency loads include all other items not necessary for ongoing operations, such as extra clothing and personal items, or Javelin CCMS or M3 Multi-role, Antiarmor, Antipersonnel Weapon System (MAAWS) in threat environments where the enemy lacks an armored capability. Contingency loads might be stored in duffel bags or palletized. Determining what goes in these loads and who is responsible for their storage and delivery is a critical decision for the commander.

LOAD DETERMINATION

5-229. Load determination is managed at company and platoon levels; however, standards are established at battalion level during planning to ensure Soldiers are properly equipped and physically ready for the conduct of operations. During this process, the commander and subordinate leaders determine the factors affecting Soldier load, and the capabilities and limitations of the unit. Load determination factors are addressed in paragraphs 5-230 through 5-244.

Load Carriage

5-230. Load carriage describes what needs to be carried and how that specific load is to be carried. Planning considerations for load carriage are vital to mission success. Commanders determine Soldier load based on

component weights and sustaining factors. These factors assist commanders during the planning process to determine how much should be carried, how far, how it is configured on the Soldier, how it is distributed throughout the unit, and how the unit is to be sustained. Commanders balance the risk to their Soldiers from the enemy, the environment, and their equipment. To assist with load planning, commanders and subordinate leaders incorporate mission analysis planning tools to address the factors of Soldier load and to mitigate the load's impact on Soldier performance for the duration of the mission. Mission analysis planning tools, examples addressed in ATP 3-21.18 chapter 3, help commanders and subordinate leaders plan, prepare for, execute, and assess successful missions.

LOAD CONFIGURATIONS

5-231. Loads are configured in three echelons: combat load (one of three configurations—fighting load, approach march, or emergency approach march), sustainment load, and contingency load. When configuring combat loads, the commander considers what ammunition, supplies, and equipment are mission-essential. Effective load configuration requires the commander to manage risk in a logical and controlled manner based on a detailed mission analysis. The commander tailors the combat load (see ATP 3-21.18, chapter 3, section II for additional information) to be carried with the unit based on this analysis and arranges for sustainment and contingency loads to be transported later.

5-232. The commander's situational understanding, personal experience, and knowledge of the capabilities and limitation of the unit enables the determination of load configuration. The commander adapts to circumstances and situations encountered, makes decisions when to drop equipment, and cross-loads equipment during movement. The commander maintains enough firepower and protection to defeat the enemy, when required, without burdening the unit with excessive loads.

LOAD IMPACT

5-233. The load a Soldier carries is a major concern to the commander and subordinate leaders planning a tactical movement. How much is carried, how far, and under what configuration are important mission considerations, requiring command emphasis. A Soldiers' ability to fight is directly related to the loads they carry. The commander attempts to minimize Soldier load to improve stealth, speed, and survivability.

5-234. Excessive Soldier loads reduce energy and agility. Soldiers carrying an excessive load are at a disadvantage when reacting to enemy contact and during the conduct of follow-on actions at the conclusion of the tactical movement. Conversely, if the load is reduced, leaders may make decisions to leave behind mission-essential or crucial equipment. Sometimes Soldiers must carry more than the recommended weights for a combat load. However, leaders must realize how this impacts the unit's overall combat power to accomplish the mission.

WEIGHT CATEGORIES

5-235. Personal protective equipment posture (PPEP) specifically Soldier body armor, constitutes the largest weight category of Soldier load. Body armor limits the Soldier's ability to maintain body core temperature and, to varying degrees, regulate breathing due to constriction of the torso. Depending on the mission variables of METT-TC (I), the commander may adjust the level of body armor protection balancing an increased risk to individual Soldiers to improve the likelihood of mission accomplishment. (See ATP 3-21.18 for more information on PPEP.)

5-236. Ammunition, supplies, and equipment carried by the Soldier is tailored to the requirements of the mission. For example, if the enemy threat does not include armor formations, a Soldier's combat load may not include the Javelin. In certain circumstances, it may be appropriate for units to carry additional ammunition due to sustainment constraints. In other circumstances, based on the enemy threat and historical analysis, it may be necessary to carry mine detectors but not electronic countermeasure equipment. Planning and preparation processes include detailed load planning and calculation to assist the commander and subordinate leaders in organizing tactical loads to manage energy expenditure and combat effectiveness.

Note. When exact equipment weights are required, see the appropriate technical manual for the item's weight.

TIME AVAILABLE AND TERRAIN AND WEATHER

5-237. The burden of load reduces the Soldier's ability to react to the enemy. Loads cause fatigue and lack of agility, placing Soldiers at disadvantages when rapid reaction to the enemy is required. Commanders consider the variables of METT-TC (I) when determining loads. Two variables, time available and terrain and weather, have the greatest effect on loads. Leaders must assess and balance the risk of the assigned mission against the risk to the unit's ability to execute the mission given their physical condition.

5-238. Time available to move the unit, under a given load, may constrain the unit's ability to arrive in the most efficient manner with maximum available energy to accomplish assigned tasks. Time constraints may force the commander to reduce Soldier loads. When loads are not reduced, Soldier physical exertion increases requiring the commander and subordinate leaders to assess the condition of their units more often.

5-239. Difficult terrain naturally slows movement due to vegetation (thick brush compared to pine forest), grade (generally flat compared to steep hills or mountain), and composition (hard packed ground or roads compared to sand, snow/ice, or scree). Heavy loads over difficult terrain quickly exhaust Soldiers and significantly reduce their physical effectiveness and cognitive capacity to accomplish assigned tasks.

Note. When necessary, dismounted marches can be hurried by conducting a forced march. Forced marches require speed, exertion, and more hours marched per day. This is normally accomplished by increasing marching hours for each day rather than rate of march. (See ATP 3-21.18, chapter 2 for a detailed discussion on forced march.)

INDIVIDUAL LOAD

5-240. To prevent an individual load from hindering a marching Soldier's mobility and combat readiness, commanders identify the minimum mission-essential equipment to fight and survive in the immediate combat operation. The primary consideration is not how much Soldiers can carry, but rather how much they can carry without reduced combat effectiveness. A unit's combat strength cannot be based solely on number of Soldiers; it must be based on number of Soldiers who are physically able to perform their duties. Soldiers become exhausted quickly when under combat stress. Soldiers must have the capability to carry heavy loads and quickly adjust to a tailored (see ATP 3-21.18, chapter 3, section II) fighting load that allows agile movement in combat.

5-241. Individual load must not be based on equipment and supplies needed to meet every possible contingency. The commander should not expect Soldiers to carry equipment for all possible combat situations. Instead, items contained in loads must be based on realistic expectations. Unit SOPs may be used to provide a standardized fighting load and approach march load (see paragraphs 5-224 through 5-226 for additional information) based on common mission requirements. The commander is responsible for tailoring fighting and approach march loads based on specific mission requirements and obtaining means to carry additional gear. Usually a rifle company or smaller-size unit requires one truck and one trailer to carry additional gear (see load carriage in paragraph 5-230). This includes cross leveling Soldier loads across the unit to ensure no element or Soldier is overloaded to a point that hinders unit success.

5-242. During the conduct mission analysis, commanders and subordinate leaders consider individual loads and understand excessive loads affect physical readiness, combat performance, and have the potential for individual and unit mission failure. The framework gauge, evaluate, analyze, and reduce (also called GEAR) provides a tool to use as a memory aid in managing Soldier load throughout planning (specifically mission analysis) and preparation (specifically PCC and PCI) as commanders do the following:

- Gauge mission requirements for the individual and unit by:
  - Assessing specific mission objectives.
  - Analyzing environmental factors influencing equipment needs.
  - Analyzing potential threats and challenges.
- Evaluate equipment selection by—
  - Identifying critical or essential equipment.
  - Prioritizing items based on mission essential and/or critical tasks (understanding ounces equals pounds and pounds impact performance).
  - Identifying threat and PPEP and mission-oriented protective posture (also called MOPP) levels.

- Analyze future needs by—
  - Identifying (based on METT-TC [I]) the most efficient and effective way to carry mission essential loads.
  - Assessing and coordinating tactical movement and equipment transportation.
  - Coordinating equipment and resupply drops/caches if needed and feasible.
- Reduce risk (analyzing risk in carrying too much/carrying too little) by—
  - Identifying if required equipment exceeds Soldiers' physiological capacity or causes time constraints to be failed.
  - Identifying how not carrying equipment could engage unforeseen enemy threats or risk to the mission.

5-243. When available and dependent upon mission variables of METT-TC (I) an Infantry rifle company or smaller-size unit requires one truck and one trailer to carry additional gear. In cold weather or during other conditions where personal gear requirements increase, this requirement increases.

5-244. The commander ensures the supply system provides balance of essential supplies and equipment not carried by the unit. Soldiers must feel confident their mission-essential needs are being met. When operating under austere conditions, the commander sets proper standards regarding Soldier field-craft techniques in the use of caches and other field-expedient measures to sustain the force.

UNIT LOAD (PACKING LIST)

5-245. Units should develop packing lists in their unit SOPs to include specific deployment options, based on guidance from the chain of command. Once deployed, commanders may send items back to support areas for inclusion in contingency loads. The composition of combat and sustainment loads is driven by the mission and commander's intent.

5-246. All Soldiers, regardless of the threat environment and mission, always carry certain items. These items are the minimum load configuration along with the Soldier's assigned weapon system and minimum amount of ammunition. Additions or deletions to minimum loads are based on the unit commander's visualization of the situation.

DECISIONS TO REDUCE OR OFFSET RISK

5-247. Risk management (RM) is the Army's process for helping organizations and individuals make informed decisions to reduce or offset risk. Using this process increases the unit's operational effectiveness and the probability of mission accomplishment. This systematic approach identifies hazards, assesses them, and manages associated risks. RM outlines a disciplined approach to express a risk level in terms readily understood at all echelons. For example, the commander may adjust the level of body armor protection balancing an increased risk level to individual Soldiers to improve the likelihood of mission accomplishment. (See ATP 3-21.10 and ATP 5-19 for a detailed discussion on the analysis of risk.)

RISK TOLERANCE

5-248. Commanders must ensure a thorough understanding of the operation, including the senior commander's intent and the risk tolerance. A commander receiving a mission will analyze it and assign subordinate missions. The combined risks identified for these additional missions and tasks may modify the overall residual risk for the mission, possibly to a higher level than the risk tolerance. (See ATP 3-21.10, appendix B that addresses the process to make informed decisions.)

CALCULATING LOAD REQUIREMENTS

5-249. Calculating loads consists of three components: common essential items carried regardless of threat, environment, or mission; duty position load, consisting of assigned weapons or components of the weapon systems; plus ammunition; and variables, consisting of all other items carried or transported, based on the commander's understanding of the situation. (See figure 5-13 on page 126.) When calculating load requirements—

- Modify combat loads into fighting, approach march, or emergency approach march loads, when applicable.
- Modify assault pack or rucksack loads per the mission or in accordance with unit SOPs.

- Organize nonessential equipment into the sustainment and contingency loads, if possible.
- Once combat loads are established, the commander determines how best to move nonessential supplies and equipment later in the operation.

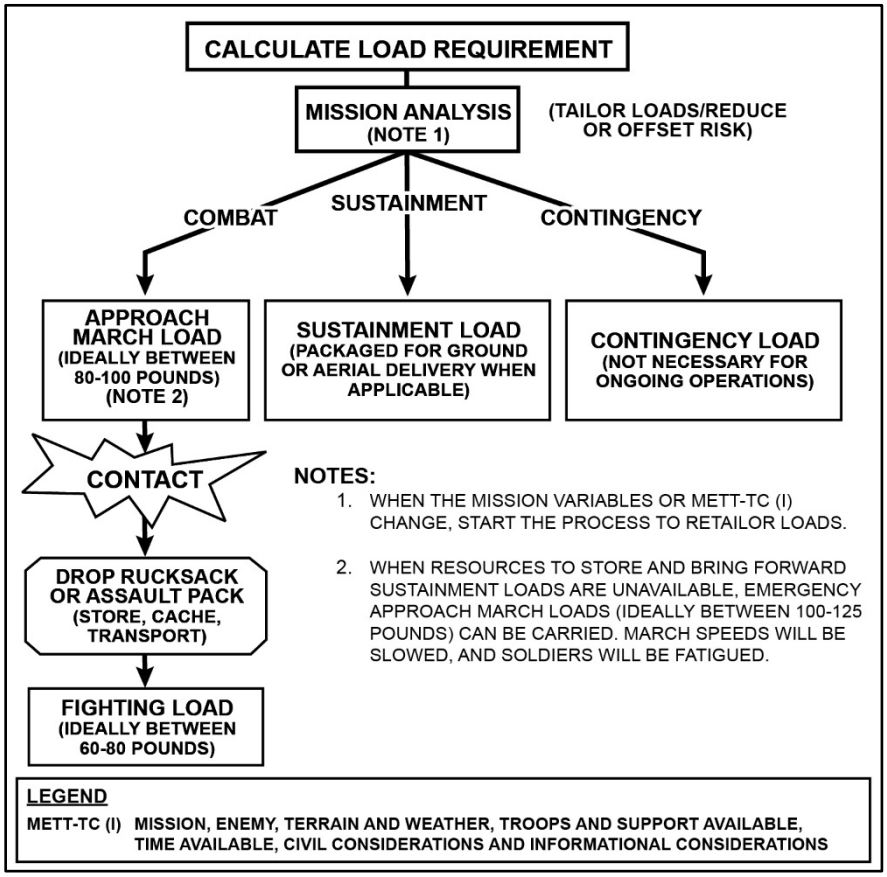


Figure 5-13. Load tailoring diagram, example

Chapter 6
Augmenting Combat Power

Integration and synchronization between elements of combat power, as in all operations, is key to successful mountain and cold weather operations. Information collection activities, when correctly employed, allow commanders and subordinate leaders to sequence actions to maintain tempo while focusing combat power at a decisive point in time and space. Infantry small-unit direct fires seldom are enough to achieve the desired effects on enemy targets in operational environments constrained by altitude and harsh weather. For small-unit leaders to engage the enemy in these environments, commanders employ combined arms teams and capabilities to close with and destroy the enemy. For example, when available, commanders support a unit's offensive actions with mortar and field artillery fires; and Army aviation and Air Force fires as early as feasible to assist in an engagement. Indirect fires and aviation fires enable units to reach into areas of defilade where direct fires cannot. Equally, engineering, protection, and sustainment activities and assets, and special purpose teams, skills, and attachments enable the success of offensive and defensive actions during mountain and cold weather operations.

SECTION I – INFORMATION COLLECTION

6-1. *Information collection* is an activity that synchronizes and integrates the planning and employment of sensors and assets as well as the processing, exploitation, and dissemination systems in direct support of current and future operations (FM 3-55). Information collection highlights aspects that influence how the Infantry small unit operates as a ground force in close and continuous contact with the environment, including the enemy, terrain and weather, and civil considerations. Through information collection, the higher commander and staff continuously plan, task, and employ collection forces and assets to collect timely and accurate information (see FM 3-96 and ATP 3-21.20). Collection helps to satisfy the commander's critical information requirements, in addition to other information requirements. Information collection, continuously updated during planning and preparation, increases the commander and subordinate leader's understanding of the enemy's intentions, actions, and relative combat power. The outcome of this analysis should replicate how the Infantry small unit would fight given its own commander or subordinate leader's insight if they were in the enemy's position. (See ATP 3-21.10 and ATP 3-21.8 for additional information.)

Note. At the tactical level, intelligence operations, reconnaissance, surveillance, and security operations are the four primary means conducted as part of information collection.

PLANNING AND EMPLOYMENT CONSIDERATIONS

6-2. Information collection should be an adaptive and continuous process; small-unit leaders need to be knowledgeable of both the commander's intent and priority intelligence requirements while understanding the capabilities and limitations of their collection abilities and the collection capabilities available from an adjacent or higher headquarters. Small unit leaders must be mindful of how terrain and weather can facilitate or prohibit the collection effort. Mountainous terrain and cold weather conditions require special considerations and can present a unique set of challenges for the small-unit leader. The outcome of information collection and intelligence analysis creates insight into how the enemy may seek to achieve its goals and should be presented in a format and language that is familiar and intuitive.

6-3. Restrictive to severely restrictive mountainous terrain and cold weather requires commanders and subordinate leaders at all levels to reconsider how to best implement, and understand what is realistic, in their collection planning. As with all mountain operations, good information collection requires shared understanding down through the lowest echelon. Information collection platforms that may be able to provide information on wide swathes of level I terrain may only be able to monitor narrow line of sights (LOSs) in levels II or III terrain. Leaders need to be empowered to think creatively to best leverage their organic

collection capabilities when working in mountainous terrain. Low-tech solutions like listening posts or observation posts (OPs) and trip flares can serve as both a protection and collection method when constant observation from assets from higher are not feasible. Similarly, understanding the full potential and functionality of equipment already on hand can help improve the common operational picture. Leveraging the full capabilities of optic systems such as spotting scopes, thermal optics, and laser range finders or target designators can increase the reach of organic collection assets. Equipment like unattended ground sensors, the Battlefield Anti-Intrusion System and M7 Spider Networked Munition Systems can allow Soldiers to monitor more real estate than optics alone. Leaders need to be well versed in the capabilities of higher headquarters and their equipment and how the effectiveness can change based on terrain and weather. For instance, in cold snowy environments, thermal optics are often more effective and will often defeat enemy camouflage. Alternatively, a scout squad operating in terrain that is canalized to either side by cliff faces may not need to bring more advanced optics with them when a simple set of binoculars will allow adequate observation of their limited LOS. Knowing what your Soldiers and equipment are capable of and balancing that with realistic Soldier loads is critical to success during all activities in an environment under harsh mountain and cold weather conditions.

6-4. Mountainous and cold weather environments more than any other demand the aggressive utilization of small well-trained teams to verify terrain and mobility classification. Imagery must be verified. Mountain and cold weather environments require Soldiers pay equal attention to terrain (for example, dead space, nature's billboards, mobility and countermobility, and LOS) as well as the enemy. Terrain and weather are mission variables, change with time, and can be hazards. Terrain and weather effects must be assessed continuously in staff estimates to inform commanders' decisions.

INFORMATION COLLECTION PLAN

6-5. The battalion commander ensures the battalion operations staff officer, in coordination with the battalion intelligence staff officer, develops the information collection plan, which includes how organic assets will answer the priority intelligence requirement. The initial commander's intent, planning guidance, and commander's critical information requirement form the foundation of the information collection plan and the basis for assessing its execution. During planning and preparation, the staff, primarily the operations and intelligence working group, develops the information collection plan and the staff products required to execute it. During execution, they oversee execution of the plan, keeping the staff products current and using them to keep information collection efforts synchronized with the overall operation. The staff updates planning requirements as operations unfold and modify the plan as necessary to satisfy new information requirements that emerge and changes to the situation. For example, changes to climate causing clouds or fog within mountainous and cold weather environments may give a marked advantage to either friendly or enemy units. The information collection plan should include contingency plans and meet the principles of cueing, redundancy, and mix. (See ATP 2-01 for additional information.)

6-6. When preparing for an operation, the Infantry rifle company commander, in coordination with the battalion commander and staff, participates in the development of the information collection plan. A well-resourced and coordinated information collection effort paints a detailed picture of the enemy situation and environmental conditions before and during an operation and provides the company commander and subordinate leaders a critical insight into how to prepare for and execute the mission. The information collection effort includes redundant information gathering that ensures a continuous flow of information to the battalion and correspondingly from the battalion to subordinate companies and platoons. Commanders and subordinate leaders use the resulting refined intelligence products to decide on a course of action (COA) and make refinements to the plan. The information collection effort provides the commander with continuous updates during the mission to adjust execution of the operation based on the enemy's reactions and sudden changes in weather conditions. For example, the battalion commander may request and allocate unmanned aerial surveillance assets to enable the collection effort on an objective and the area surrounding the objective. (See ATP 3-21.20 and ATP 3-21.10 for additional information.)

EXECUTION OF TACTICAL MISSIONS

6-7. Executing collection focuses on requirements tied to the execution of tactical missions. At the tactical level, reconnaissance, surveillance, security operations, and intelligence operations are the four primary means conducted as part of information collection.

RECONNAISSANCE AND SURVEILLANCE

6-8. The reconnaissance and surveillance (R&S) effort at battalion and company level, performed before, during, and after operations, provides information used in the intelligence preparation of the operational environment (IPOE) process and mission analysis, respectively, as well as by small-unit leaders to formulate, confirm, or modify a COA. Before conducting an operation, commanders and subordinate leaders, through R&S, identify terrain characteristics, enemy and friendly obstacles to movement, and the disposition of enemy forces and civilian population, so they can maneuver their forces freely and rapidly.

6-9. During hasty operations the entire information collection, analysis, and dissemination process must respond rapidly to each of the commander's critical information requirements. The company commander, when required, deploys a reconnaissance patrol(s) (see ATP 3-21.8, chapter 7) and surveillance assets (see ATP 3-21.10) early in the planning process to facilitate information collection. The commander ensures R&S is continuous during mission planning, preparation, and execution. Information collected during R&S may result in initial plans or COAs being modified or even discarded. Further, when the plan changes, the commander must modify the R&S objective(s) to support the new plan.

Note. The commander should consider the risk of losing the element of surprise when employing reconnaissance patrols and surveillance assets close to an objective area or along friendly movement routes after the line of departure or line of contact.

SECURITY OPERATIONS

6-10. Security operations—screen, guard, and area security—are essential when operating in an environment under harsh, mountain and cold weather conditions. The Infantry company as a whole under these conditions is often most vulnerable to surprise and enemy attack during preparation for future operations when forces are often operating in noncontiguous assigned areas. The company security plan compensates for the assumed risk with heightened security, OPs, reconnaissance and security patrols, unmanned ground sensors, and any other measures that might be available to the commander. For example, subordinate elements of a company assigned security patrol missions (see ATP 3-21.8, chapter 7) between unit positions protect elements of the company while distributed within an area of operations (AO).

6-11. Within an area defense, commanders and subordinate leaders consider activities within the security area(s) that inhibit the enemy compromising the friendly defensive operation. Commanders consider combat patrols (ambushes and raids) and security patrols in concert with the preparation of defensive positions. The combat power applied to these actions are affected by the mission variables of METT-TC (I), which stands for mission, enemy, terrain and weather, troops and support available, time available, civil considerations, and informational considerations—and the higher commander's intent.

6-12. When emplacing listening, OPs, and launching reconnaissance and security patrols, commanders ensure all patrols and OPs are situationally aware of units forward of or adjacent to their position. It is important for subordinate elements conducting OPs and reconnaissance and security patrols to relay valuable information collected by forward Infantry units and battalion scouts and adjacent units as to ensure other positions within an AO have up to date situational awareness. The commander employs enough forces in the battalion or company's security area to gather information regarding enemy movement, without severely degrading defensive preparations, manning, and posture.

6-13. Once assigned an AO, the Infantry rifle company commander or subordinate platoon leaders analyze their precise positions or axis of advance that subordinates will occupy or use, respectively. In the defense, the commander or subordinate leader determines any potential area between higher headquarters, adjacent and subordinate units that is unassigned. Any area within an AO that is not assigned to a subordinate unit remains the responsibility of the higher unit. The higher unit may plan to cover this area with available surveillance assets, to include ground sensors and echelon-specific unmanned aircraft systems (UASs) along with higher echelon information collection assets, or with OPs and reconnaissance and security patrolling. Dependent upon mission analysis, the commander may accept risk by placing no assets to monitor or react to this unassigned area. The commander plans local counterattacks to isolate and destroy any enemy that manages to penetrate through a gap in the AO, including unassigned areas. (See chapters 3 and 4 for additional information on security operations within the offense and defense.)

INTELLIGENCE OPERATIONS

6-14. *Intelligence operations* is the tasks undertaken by military intelligence units through the intelligence disciplines to obtain information to satisfy validated requirements (ADP 2-0). Intelligence drives operations and operations support intelligence; this relationship is continuous. Intelligence disciplines, supported by military intelligence personnel, include—counterintelligence, geospatial intelligence, human intelligence (HUMINT), measurement and signature intelligence, open-source intelligence, signals intelligence, and technical intelligence. Intelligence disciplines support reconnaissance and security operations through which intelligence units and staffs complete tasks in intelligence operations. Additionally, complementary capabilities such as biometrics, cyberspace, electromagnetic warfare (EW), space, identity activities, and forensics, along with document and media exploitation, ensure the successful accomplishment of intelligence tasks. (See FM 2-0 for a detailed description of capabilities and disciplines.)

6-15. Military intelligence units, external to the Infantry brigade combat team (IBCT), conduct R&S missions. They provide electronic intercept, UAS sensor feeds, and HUMINT, counterintelligence, and downlinks from theater of operations and national assets. Theater of operations and national R&S systems provide broadcast dissemination of information and intelligence and provide near real-time imagery as a part of an integrated intelligence effort. Artillery and air defense target acquisition radars complement military intelligence surveillance systems as a part of that effort. (See FM 3-96 and FM 2-0 for additional information.)

6-16. Communications intelligence assets have been used extensively in mountain environments (most recently in Afghanistan) to locate the enemy from the point of origin of the signal, and to listen to the message traffic to help determine their intent and plans for enemy actions. Communications intelligence systems can not only be used to monitor for unexpected transmissions but can also be used in combination with a planned offensive operation by monitoring for expected transmissions in response to a friendly action. For example, a patrol conducted in mountain terrain should expect that they are being observed by enemy forces and that their movement into an area is detected. Using communications intelligence systems to actively monitor for subsequent enemy radio transmissions as a result of patrol movements can pinpoint a suspected location and orient patrol efforts. Message content may also determine enemy intent such as an ambush set up to intercept the patrol. This information to a leader is invaluable, as it not only gives a location but a probable course of enemy action. The enemy at this stage loses the element of surprise and leaders can prepare for an organized response.

SOLDIER SENSOR MISSIONS

6-17. To ensure maximum combat effectiveness, Soldiers should master a diverse set of skills. On a battlefield fought among enemies that are difficult to recognize and that use nonconventional tactics, Soldiers should be keenly aware and astute to anomalies, changes, and other clues in the surrounding environment and populace that may signal danger or threats. The concept of Soldier sensor missions is that Soldiers are indispensable sources for an abundance of information that can be used by intelligence assets. Observations and experiences of Soldiers provide depth and context to information gathered through R&S. Soldiers should report their observations, even when not assigned an R&S mission. Soldiers often work in and among the local populace and can read, sense, or detect abnormalities, inconsistencies, or irregularities in their behavior or actions. The same can be said about the environment in which the Soldier operates. All Soldiers should look for anything that seems out of place or inconsistent with what is normally encountered and report their findings.

6-18. In mountain operations, information detected by Soldiers may be as simple as a pile of rocks that looks out of place or indigenous personnel acting strangely or overly curious as to the unit's actions. For example, mountain passes are prime locations for an ambush and sites may be enhanced with explosives to corral or confuse friendly units. An alert Soldier may detect a change or disturbance in the terrain from a previous mission, which could indicate possible buried explosives. Populations often unintentionally give off clues to danger. Generally, local personnel gather in towns and villages, many being in lower lying areas. Soldiers may also encounter villages and populace in the mountains. Soldiers should remain vigilant and attentive to details about local personnel that may indicate possible enemy activity.

SECTION II – DIRECT FIRES

6-19. Suppressing or destroying the enemy with direct fires is fundamental to success in close combat. Direct fire is inherent in fire and movement, as is close combat although considerately more difficult when operating in an environment under difficult and harsh, mountain and cold weather conditions. The Infantry rifle company commander and subordinate leaders focus, distribute, and shift the overwhelming mass of direct fire at critical locations and times to succeed in combat. Through efficient and effective direct fire planning and control, Infantry small units acquire the enemy and mass the effects of fires from all attached and organic weapons to achieve decisive results in the close fight.

Note. *Fire and movement* is the concept of applying fires from all sources to suppress, neutralize, or destroy the enemy, and the tactical movement of combat forces in relation to the enemy (as components of maneuver applicable at all echelons). At the squad level, fire and movement entails a team placing suppressive fire on the enemy as another team moves against or around the enemy (FM 3-96).

FUNDAMENTAL PRINCIPLES

6-20. Effective direct fire planning and control requires the company to acquire the enemy and mass the effects of fires rapidly to achieve decisive results in the close fight. The commander and subordinate leaders apply several fundamental principles when planning, preparing for, and executing direct fires. The purpose of these principles is not to restrict the actions of subordinates. Applied correctly, the principles help the Infantry rifle company to accomplish its primary goal in any direct fire engagement; that is, both to acquire first and shoot first. The following principles (see ATP 3-21.10 for a detailed discussion of each principle) give subordinates the freedom to act quickly upon acquisition of the enemy:

- Destroy the greatest threat first.
- Avoid target overkill.
- Mass the effects of fire.
- Employ the best weapon for the specific target.
- Minimize exposure.
- Plan and implement fratricide and friendly fire avoidance measures.
- Plan for limited visibility conditions.
- Plan for degraded capabilities.

DIRECT FIRE WEAPONS AND SYSTEMS

6-21. To gain maximum effectiveness during fire and movement, Soldiers and leaders should be thoroughly familiar with all weapons in their unit and with those that could support them. Common squad direct fire weapons include semiautomatic rifles, automatic weapons, grenade launchers, and shoulder launched munitions (SLMs). An Infantry rifle platoon conducting a combat patrol would have its organic weapons squad, manned with two machine guns and two Javelin close combat missile system (CCMS) or M3 Multi-role, Antiarmor, Antipersonnel Weapon System (MAAWS). Through mission analysis, leaders determine whether to keep the weapons squad pure or to attach a machine gun(s) or missile system(s) to a specific squad(s) during small-unit operations. Snipers (from the battalion sniper squad) and designated marksmen (identified within the platoon), attached or identified, respectively, are employed to maximize their unique capabilities. (See ATP 3-21.8 for additional information on direct fire weapons and systems within the Infantry rifle platoon.)

Note. Soldiers confirm zero on all direct fire weapons upon arriving in mountainous and cold weather areas to compensate for environmental differences along with any changes that occurred during movement to an AO. Whenever possible, units re-zero their weapons after large changes in temperature or elevation. Maintaining an accurate zero is key for all Soldiers. Aim points may also need adjustment for wind or for firing at large angles.

SMALL-ARMS AND MACHINE GUNS

6-22. Engaging targets with direct fires in mountain terrain can be deceiving and frustrating unless personnel are at least generally familiar with the effects of bullet trajectory while shooting from and to different elevations. Many factors affect the trajectory of bullets in the mountains including differences such as the decrease in atmospheric pressure. Weapon-mounted or ground-mounted optics are valuable assets for mountain operations, especially in or near max range direct fire engagements, and can help compensate for these differences if used properly. Weapon-mounted optics should be used whenever possible on both crew served and individual weapons.

6-23. During target engagements, aiming points for direct fire weapons, including all small-arms and machine guns, may have to be adjusted depending on the angle of the target from the shooter. (See figure 6-1.) Angle shooting is the term used for engaging a target at a different elevation than the shooter. Angle shooting affects the trajectory of the projectile. At close distances, the effect is minimal. At further distances the effect can result in a target miss above the target unless the shooter compensates for the difference and aims low. This is true whether the target is at a higher elevation than the shooter or at a lower elevation than the shooter.

6-24. The shooting range and angle to the target determines how far below the target to aim. These effects can be accounted for if the range to the target is known fairly accurately. As range increases, beyond 400 meters (1,312 feet), the effects can become noticeable and need to be accounted for when engaging a target. Without some type of range determining electronics, Soldiers often tend to overestimate the range to a distant target on an angle. Overestimation of these ranges may have the opposite effect and cause a shooter to miss high. As a rule of thumb, and without determining the exact range and amount of compensation needed, Soldiers should aim at the base of the target for any partially exposed target. For a fully exposed target, aim point should be approximately at waist level.

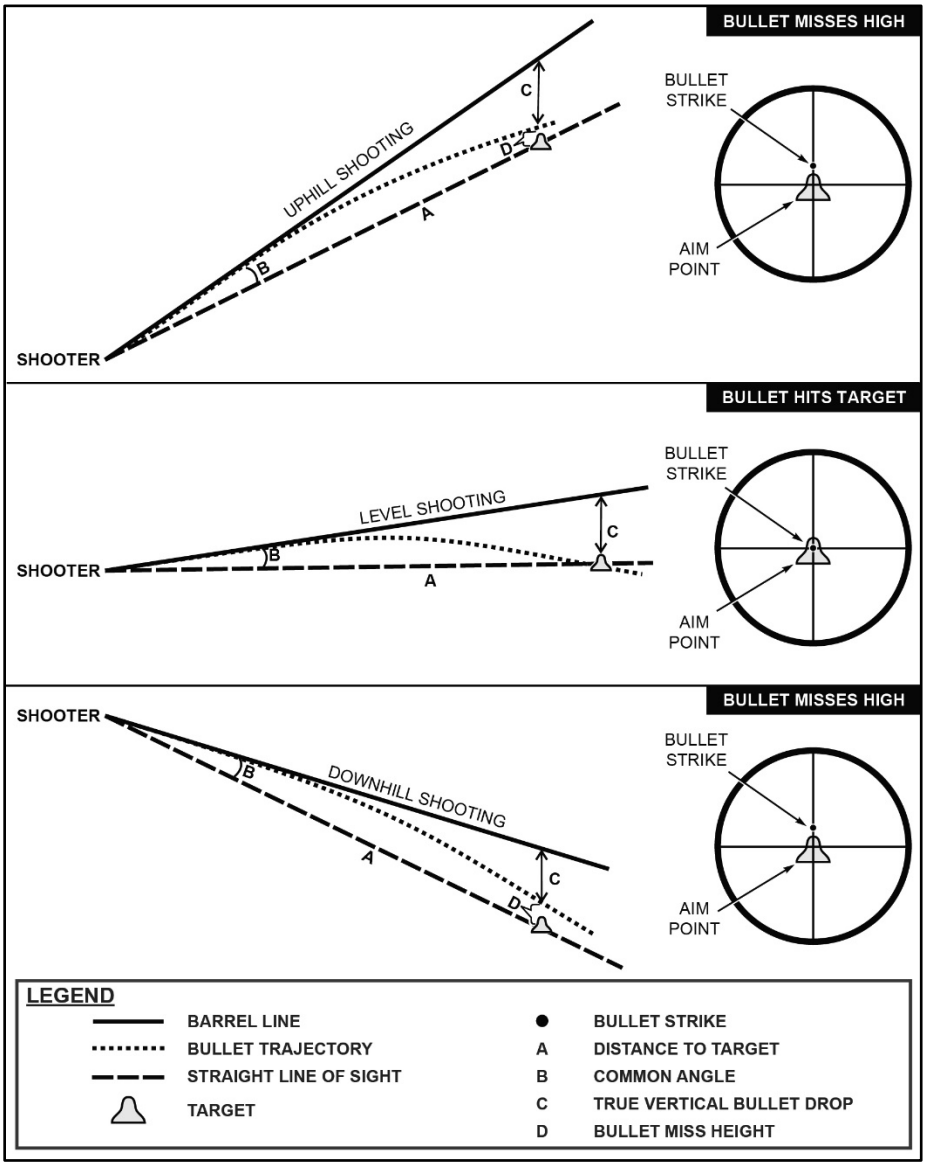


Figure 6-1. Angle shooting

6-25. Wind can also be a major contributing factor in adjusting aim points to engage targets. While wind at any elevation can be an issue when shooting long distances, mountain winds can be extremely strong and are often more constant than at lower elevations. Strong mountain winds can cause bullets to drift off the aim point significantly. Smoke near, or within, an engagement area (EA) gives some indication to the direction and strength of wind currents to aid in aim point adjustments. Learning to adjust to these conditions takes some practice but leaders and Soldiers need to know how these conditions affect their aim points to compensate for them.

SHOULDER LAUNCHED MUNITIONS AND CLOSE COMBAT MISSILE SYSTEM

6-26. SLMs and CCMS (or MAAWS) can be effective in mountain operations but limiting factors often preclude them from use in higher-level rugged terrain. While planning for the use of these systems in mountain operations, leaders need to consider that one of the main impacts they have on operations is their weight and the ability to carry them into mission area locations. Leaders have to determine the impact on Soldier strength and endurance as opposed to the advantage of having these weapons available for use. As SLM and CCMS (or MAAWS) systems can be bulky (weighing between 8 and 18 pounds) and cumbersome

for dismounted operations in mountain terrain, leaders may preclude them from mountain patrols when compared to the probability of needing their employment. Commanders consider their usefulness on missions where few vehicles can travel with the unit. While the command launch unit can offer great optics for increased observation capabilities, its weight is also a consideration when planning for its employment.

6-27. In mountainous terrain, SLMs and CCMS (or MAAWS) are effective weapons for integration into defensive and offensive operations. These systems can cover likely main avenues of approach or provide overwatch during tactical movement and offensive actions. Commanders integrated these systems into the concept of operations with other direct fire weapons and fires, capitalizing on their unique capabilities. When used accordingly, SLMs and CCMS (or MAAWS) can have a much greater effect on targets hiding among the mountain rocks than other direct fire weapons. Theses munitions have the capability of penetrating rocks and creating explosive debris unlike many small-arms munitions.

6-28. The Javelin CCMS (or MAAWS) is an effective system for long-range engagements of hard targets. The system's command launch unit offers great optics for increased observation capabilities, for example in an OP, or within an overwatch position or defensive position. SLMs, such as the M136 AT4, the M72A7 light antitank weapon, and the M141 bunker-defeat munition, supplement and reinforce CCMS (or MAAWS) fires at close ranges. Considerations may include the bunker-defeat munition for use against caves, tunnels, and fortified positions. SLMs may be an option as they are less bulky in the collapsed position and can be used to incapacitate the enemy in caves and tunnels. Leaders determine the use of these systems for each operation based on the mission variables of METT-TC (I) mission, enemy, terrain and weather, troops and support available, time available, civil considerations, and informational considerations. (See ATP 3-21.8 for additional information.)

SNIPERS AND DESIGNATED MARKSMEN

6-29. Snipers (see ATP 3-21.20) and designated marksmen should be employed to maximize their unique capabilities. Snipers, particularly, are trained specifically in observation techniques and are equipped with enhanced optics. They may be used as OP observers or positioned to cover a likely avenue of approach for a defensive position. Snipers may be positioned on a high point with 360-degree observation where they can observe as well as engage targets.

Note. The designated marksman acts as a member of the squad under the direction of the squad leader or as designated by the platoon leader. Although normally functioning as a rifleman within one of the fire teams in a rifle squad, the designated marksman is armed with a modified rifle. The designated marksman is trained to eliminate high-payoff enemy personnel targets (such as enemy automatic rifle teams, antitank teams, and snipers) with precision fires. (See ATP 3-21.8 for more information.)

6-30. Snipers give the unit leader the ability to interdict targets while providing real-time reporting and warning. They can observe key terrain, engage with precision offensive or protective direct fire, and call and adjust indirect and aviation fires. In a mountain environment, snipers are an extremely valuable asset. Snipers should be equipped with items, such as laser rangefinders and cosign indicators to assist in determining the effects of angle on ballistics.

6-31. A sniper's unique training in camouflage, concealment, and movement allows the sniper to move into difficult or remote mountain positions undetected to observe and engage targets with direct fire, or coordinate for supporting fires (see ATP 3-21.20, appendix E). Snipers conduct R&S during distributed operations. They identify targets, feeding target locations to other assets, such as indirect and aviation assets, for target engagement. Finding the enemy in the mountains is a challenge for snipers as it is for any unit. It requires patience, discipline, and attention to detail. It often becomes a waiting game for the enemy to appear.

6-32. A critical step in the employment of snipers in a mountain terrain is the planning and preparation of the mission. Planning considerations should include—

- Developing a detailed terrain analysis.
- Asking questions about the terrain and routes.
- Having discussions with personnel that have operated on that terrain.
- Possessing maps showing smaller but still potentially dangerous terrain features.

- Using available intelligence assets including satellite imagery, intelligence personnel, and unit personnel.
- Identifying historically high threat areas and potential attack locations and minefields.
- Avoiding areas where mobility is further decreased, such as in mud or deep snow, upon infiltration and exfiltration.
- Understanding the effects of temperature, altitude, and wind in the area.
- Equipping snipers with altimeters to take the guess work out of determining an altitude.
- Masking movements in the mountains by staying in draws and staying off ridges.
- Moving at night and observing during the day.
- Using early morning mountain fog to obscure movements and insertions.
- Using night observation devices during movements at night.
- Considering all insertion means including air, vehicle, and foot.

EMPLOYMENT CONSIDERATIONS

6-33. Infantry small-unit leaders communicate to subordinates the manner, method, and time to initiate fires, mass fires, shift fires, and to disengage. They control direct fire engagements against enemy systems to gain a decisive effect against the enemy. Leaders use the results of the analysis of the mission variables of METT-TC (I) to determine the most advantageous way to use direct fires against an enemy and to reduce fratricide from direct fire systems. (See ATP 3-21.8 for a detailed discussion of direct fire planning and control measures.)

Elevation Considerations

6-34. Unique considerations for the employment of direct fires in mountain environments include the use of nonstandard shooting positions due to the steep angles often required for target engagement.

6-35. Adjustments may be required for limitations in the up or down angle of traversing and elevating mechanisms for mounted or fixed weapon systems. Modification of existing mounts or placing sandbags under crew-served weapons to elevate the weapon and engage targets at high angles may be necessary. The use of plunging fires is a substitute for direct fire weapons that are less effective in rocks, boulders, and defilade positions.

6-36. The use of hand-carried machine guns to fire on steep ridgelines close to the road or path because other heavy firepower systems are limited.

Target Acquisition and Accuracy

6-37. Identifying acquired targets by using tracers also marks the area for other direct fires. Laser pointers and infrared illuminators may also be used for the same purposes at night. Establish target reference points on standard range cards for known distances in mountainous terrain where distances can be difficult to judge in addition to establishing wind indicators for unpredictable and constantly changing mountain winds. Indicators of wind strength and direction help determine where to aim direct fire weapons for effective engagements.

6-38. Use grenade launchers and grenade machine guns to fire into dead space and cover areas not possible with small-arms and carry tripods on patrols to ensure accurate firing of machine guns.

SECTION III – FIRE SUPPORT

6-39. Fire support is the collective and coordinated use of indirect fire weapons and armed aircraft in support of the commander's scheme of maneuver. Fire support planning is the process of analyzing, allocating, and scheduling fire support assets. Fire support capabilities available, dependent upon the mission variables of METT-TC (I), to the Infantry rifle company in mountain operations generally include indirect fires (field artillery cannons and rockets, and mortar fires) and aviation fires (Army attack aviation and Air Force close air support [CAS] fires), and organic UAS (manned and unmanned) and/or tasked echelon-specific UAS (see paragraph 5-212) firing platforms. (See ATP 3-21.20 for additional information, to include information on naval gunfire and electromagnetic attacks.)

INDIRECT FIRES

6-40. Indirect fires provide the most fire support to the Infantry rifle company. Indirect fire support systems include field artillery cannon and rocket systems, and mortars. (See ATP 3-09.32 for a detailed listing of indirect fire system capabilities and characteristics.) Indirect fire support systems may be under direct command of the maneuver company/battalion or may be in a supporting role. Commanders plan indirect fire targets during tactical movement and during the conduct of offensive and defensive operations on probable locations of enemy action or activity. Call for fire is the request for fire containing data necessary for obtaining the required field artillery and mortar fire on a target. (See ATP 3-21.10 for additional information, specifically artillery and mortar call for fire.)

FIELD ARTILLERY FIRES

6-41. Field artillery indirect fires are valuable assets in the mountains. High-angle fires can assist in reaching into defilade positions and the combat power and destructiveness of artillery munitions has both a physically and psychologically traumatic effect on the enemy. High-angle fires are often preferred in mountain terrain to engage targets in defilade. In addition, high-angle fires may be preferred for safety reasons. Low trajectory rounds fired into uneven, sloping, rocky terrain may tend to skip and detonate in an unintended area. Leaders need to enforce the daily inspections of indirect fire systems as missions fired at max charge and high angle, both common in mountain engagements, are extremely hard on cannon and mortar base plates.

6-42. In mountain terrain, availability of firing positions may be limited. Road access may be restricted for both movement and resupply. Artillery positions require trafficable access into the sites if emplacement and resupply will be by ground vehicles. Towed artillery may be air lifted by helicopter into positions. Field artillery units inserted by air should have adequate level positions and resupply areas as well. With automation capabilities, the guns need not be in one location but dispersed throughout the area. Firing positions are often configured for 360-degree fires, as indirect fires may be required in any direction in mountain operations (see figure 6-2).

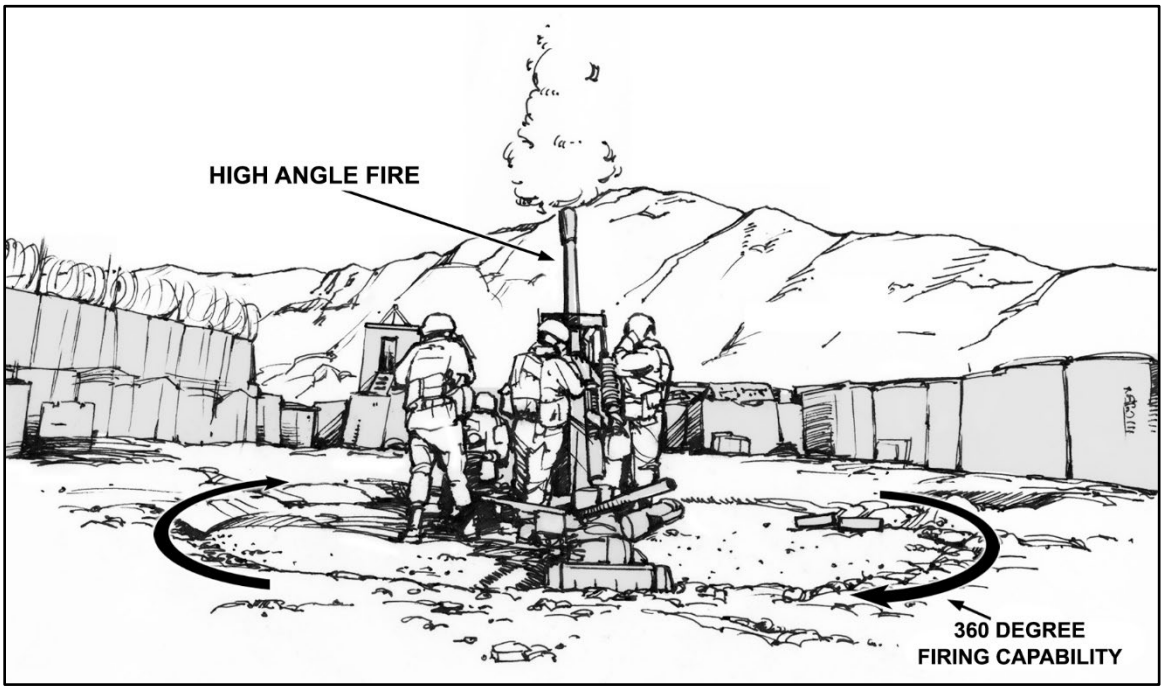


Figure 6-2. Mountain field artillery firing position outpost

6-43. Steep mountain terrain creates challenges for adjusting and ensuring effective indirect fires. It is important to remember that an artillery round impacting 50 meters away from the intended target on fairly level or close to level terrain may have good effects while the same horizontal 50 meters in mountain terrain may cause the round to impact significantly above or below the target. Due to a steep mountain slope, the

impact of these rounds may render no effect at all (see figure 6-3). Observers should know this consequence and consider creeping rounds for adjustments to increase the probability of target effects. Creeping adjustment rounds from a lower elevation up to the target are often better since impacts over a ridgeline are difficult or impossible to observe.

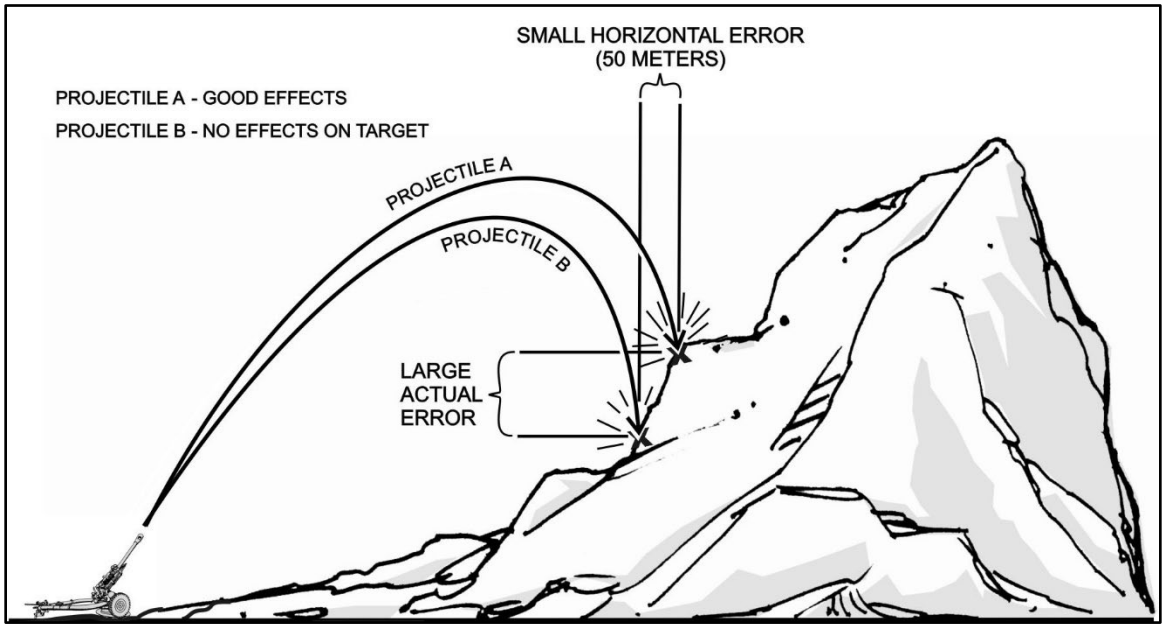


Figure 6-3. Mountain effects on indirect fires

MORTAR FIRES

6-44. Mortars are a tremendous asset in mountain operations. They are relatively easy to emplace and set up in mountain terrain and are moved quickly. By design, they are well-suited for firing into defilade positions. Infantry rifle company 60-millimeter (mm) mortars can be carried by personnel wherever dismounted movements are possible. These mortars are a readily available, quick response, indirect firepower asset for the company, specifically, in direct lay or handheld mode. Battalion-level mortars can be used to support company or smaller unit operations but often must be carried and emplaced using some sort of vehicle or other transportation asset. Resupply of ammunition to these mortars is somewhat easier to accomplish than resupply to a dismounted unit where vehicles cannot travel.

6-45. Mortar rounds are affected by terrain and meteorological conditions like artillery rounds. Artillery considerations can be applied to mortars as well with the lighter rounds, less trajectory altitude, and shorter flight times accounting for differences in how mortar rounds versus artillery rounds are affected. Meteorological data and registration, when possible, can increase accuracy of the mortars.

6-46. Company commanders may consider employing company mortars by keeping one with the main body and sending one with a platoon or squad on patrol. During dismounted operations, commanders must account for carrying mortar rounds as well as the system itself. Mortar rounds not used during the conduct of a dismounted mission are recovered upon completion of the mission and carried back out.

6-47. Clearance of company mortar missions often remains at the company level, which can aid in a quick fire mission response. An even quicker response is achieved by firing 60-mm mortars in the handheld, direct lay mode. These quick mortar engagements can suppress enemy targets while the unit moves to a position of advantage. Rules of engagement (ROEs), particularly concerning airspace clearance of indirect fires, are adhered to in all instances.

6-48. Suitable mortar firing positions can be a challenge to find but are typically easier to locate than artillery positions. Once located, it can be extremely difficult to dig them into a rocky position. Mountain terrain often makes digging in a less feasible option than the alternative method of building up a mortar position, which also creates some unique problems while firing. During a direct attack, the gunner often is exposed to the

enemy in order to see the aiming stakes from a built-up position. One technique to alleviate this problem is to mark the inside walls of the built-up mortar position with known directions or target reference points. In this way, a gunner traverses the mortar to a desired deflection without directly having to observe the aiming stakes.

6-49. Mortar positions, often established within the confines of a defensive position, alleviate the need to provide separate security personnel in an already personnel constrained situation. As with artillery positions, mortars in defensive positions usually prepare to fire in all directions.

EMPLOYMENT CONSIDERATIONS

6-50. The importance of indirect fires cannot be overstated. Mountainous terrain brings along with its climatic conditions and other external factors that may limit the use of fires from aviation assets but do not affect indirect fires. Additionally, indirect fire assets can maintain sustained fire support operations to units that aviation fires assets may be unable to maintain due to weather, station time, or payload capabilities.

6-51. The ability for mortars (field artillery as well) to engage targets on reverse-slopes and areas of defilade is a tremendous advantage for combat in mountain terrain. As with other operations, employing indirect fires in mountain terrain and climate does have its challenges. Unique challenges include the following:

- Weather conditions (wind speed and direction, atmospheric pressure, and so forth) may affect the accuracy of rounds based on mission-limiting weather thresholds for specific rounds.
- Targets may be located on peaks and steep terrain making adjustments difficult.
- Intervening crests require placement of observers on dominating heights for observation.
- Terrain suitable for firing positions to cover a particular mission may be limited.
- Location of artillery and mortars positions ideal for range and coverage might not be suitable due to intervening mountain terrain features.
- Locations may be tactically positioned, but in an area prone to avalanches or flash floods.
- Shifting of indirect fire assets (specifically heavy and medium mortars, and field artillery) to alternate locations may require significant engineering and logistical efforts.

6-52. High-angle fires can engage targets behind crests, in defilade, and other unobservable areas otherwise not targetable with direct fires. High-explosive airbursts tend to be more effective than point-detonating rounds in mountain terrain. Point-detonating rounds impacting in rocky areas may achieve good effects due to the addition of rock splinters, but larger boulders may provide some protection from those splinters and shell fragments.

6-53. In winter, rounds impacting in deep snow may have a higher incidence of duds. Deep snow, as well as large rocks, can also reduce the radius of lethality for impact shell bursts. Airburst detonations help improve lethality. Proximity fuzes are often preferred in mountain terrain but in snowstorms may give false reading causing rounds to detonate prematurely.

6-54. White phosphorous (WP) smoke may be used as a marking round for orienting direct fires and fires from aviation assets. Leaders should consider that using WP might be hard for pilots without thermal sights to see in snow. WP is used cautiously in snow as pieces of WP may continue to burn for days if covered by snow. Colored smoke or near-surface illumination bursts may be used to mark targets for aircraft in conditions where snow is present.

6-55. Atmospheric conditions may significantly alter an indirect fire round's trajectory. The projectile may be affected by minor variations in wind, air density, air pressure, and air temperature from round to round. Current meteorological data or registration data need to be available to account for these and other meteorological conditions. Ballistic meteorological data with a valid registration mission helps ensure increased first-round accuracy. Registration missions, when possible, are conducted at an elevation close to that of a planned mission. A large change in elevation often requires a new registration be conducted as the altitude difference can affect the accuracy.

6-56. Precision munitions such as the guided multiple launch rocket system missiles or the 155-mm Excalibur round are effective in engaging precisely located targets. These Global Positioning System assisted rounds can correct for unanticipated meteorological conditions in the target area.

6-57. Mountain operations may require the firing of danger close missions to engage targets in close battles. Meteorological data is updated as frequently as possible to increase accuracy.

6-58. Commanders should consider targeting likely and previously identified enemy firing positions. The enemy may establish a pattern or reuse firing points and calculated data to those targets can provide for rapid counterfire.

AVIATION FIRES

6-59. Aviation fires increase the overall combat power, mission effectiveness, agility, flexibility, and survivability of Infantry small-unit operations. Air action by rotary- and fixed-wing aircraft against hostile targets that are near friendly forces require detailed integration of each air mission with the fire and movement of ground forces. This section focuses on Army attack aviation and CAS fires in support of the ground maneuver force in mountainous environments.

ARMY ATTACK RECONNAISSANCE AIRCRAFT

6-60. Army attack reconnaissance aircraft can be extremely useful in the mountains and are often used to support ground force close combat operations. These aircraft can effectively engage targets hiding in rugged mountain terrain too difficult to reach by foot and can assist ground forces in target location and target engagements. Final coordination (call for fire) for actual engagements should be through direct voice communications between the aircraft and the supported unit. Attack reconnaissance aircraft can change to the company command net for direct communications where leaders can then direct them onto an exact target. (See ATP 3-21.10 for additional information, specifically Army attack aviation call for fire format.)

6-61. A terrain feature or other means of marking the target is often used as a reference to locate a target for the pilot. Mortar WP rounds, visible to the aircraft and the ground unit can mark a target or establish a reference point for guiding pilots onto targets. If mortars are not available, aircraft are often able to mark a target grid with aircraft delivered WP. Ground units can then refine corrections onto the target using the marking round for reference. If the target is within range of grenade launchers, colored smoke marking rounds may be used.

6-62. In a defensive engagement, the response time for attack reconnaissance aircraft is affected by the availability of aircraft and the distance to the unit under attack. In a particular AO, the enemy may learn from repeated engagements approximately how long it takes air assets to arrive once they attack a unit and plan their actions accordingly. They may try to cease their attack before or when friendly air assets arrive. They may also attempt to conduct their operations during conditions where air assets are grounded or hampered by limited visibility.

6-63. Attack reconnaissance aircraft may be used as a show of force to discourage enemy units from performing offensive actions. Coordination can be made with any aircraft conducting nearby operations to simply fly over or near a planned company movement to deter aggressive actions and ambushes.

ATTACK RECONNAISSANCE AIRCRAFT DISADVANTAGES

6-64. Major limitations for the use of attack reconnaissance aircraft include the number of aircraft available as sorties are often limited and in high demand in mountain operations. It is time consuming to get the aircraft on station and available aircraft are less effective if they are too far away or must take a lengthy indirect route.

6-65. Current or pending weather conditions may ground the aircraft. High mountain ridges may be at an elevation that restricts movement of rotary-wing aircraft across them. Simply getting the aircraft to a target area may be restricted if available aircraft are on the other side of the mountains with ridges above a certain altitude.

6-66. Travel time to locations may be lengthy and use a substantial amount of fuel, reducing time on station and requiring refueling. Locations for rearming and refueling may also be some distance away.

CLOSE AIR SUPPORT

6-67. The IBCT normally plans and controls CAS; however, this does not preclude the Infantry battalion from requesting CAS, receiving immediate CAS to support company-level operation, or accepting execution

responsibility for a planned CAS mission. In planning CAS missions, commanders and subordinate leaders must understand the capabilities and limitations of CAS and synchronize CAS missions with both the battalion fire plan and company scheme of maneuver. CAS capabilities and limitations in mountainous and cold weather regions, in addition, to windows for use, target identification, observers, and airspace coordination, present unique challenges to the planning of CAS missions. The unique challenges to planning CAS missions in these regions, for the most part, are the same as addressed for the employment of Army attack reconnaissance aircraft in those regions (see paragraphs 6-60 to 6-63).

6-68. As with Army attack reconnaissance missions, final coordination for CAS missions is conducted by direct voice communications between the aircraft and the supported unit, but this time through a joint terminal attack controller during terminal control procedures. CAS missions can be conducted using a non-joint terminal attack controller certified individual but must be clearly stated to aircraft as such. This alerts the aircrew to be prepared to pull information to complete the critical portions of the CAS briefing. (See ATP 3-21.10 for additional information, specifically game plan and 9-line CAS brief.)

6-69. As mountainous terrain can all look very similar, often some type of marking system is needed to help identify a target. A CAS aircraft, as with an attack reconnaissance aircraft, can deliver WP munitions to use as a reference point.

6-70. The commander may use a fixed-wing aircraft, such as an A-10 or F-16, as a show of force to discourage enemy units from conducting offensive actions. Ground units not wishing to make contact with the enemy may use fixed-wing aircraft to discourage enemy actions just by their mere presence. Since most CAS missions are planned missions with coordination accomplished many hours or days in advance, the availability of assets to aid in defending a position from a surprise attack is sometimes limited. Aircraft used in these circumstances are often diverted from another mission.

6-71. Mountainous terrain may restrict CAS engagements. Pilots will select a suitable approach route to the target area in the event a non-joint terminal attack controller qualified controller is conducting the request. Targets may not be clearly visible to fast moving aircraft due the terrain itself, climate and weather conditions, or a combination of both. Enemy personnel and equipment can hide among the rocks and in cracks, crevices, and draws. Those same features can create dark shadows on targets depending upon the time of day. Target identification for CAS missions can be enhanced with lasers or smoke for marking enemy positions.

6-72. Mountain weather conditions may restrict fixed-wing aircraft from flying at all or may create a situation where aircraft personnel cannot see or find the target. Climate conditions that often affect aircraft include clouds, heavy rain, snow, dense fog, and gusting winds. (See JP 3-09.3 and ATP 3-09.32 for more information.)

EMPLOYMENT OF AVIATION ASSETS

6-73. Aircraft can attack targets that cannot be effectively engaged with other systems in mountain environments. The two major limiting factors for aircraft are their availability and the restrictions placed on their employment due to terrain and weather conditions. While coordination, deconfliction, and the use of air space and air corridors will be accomplished at higher levels of command, company commanders should be aware of how mountain terrain and other restrictions may affect the use of air assets for their operations. For example, high mountain ridgelines that create a natural air avenue of approach may restrict friendly air assets from attacking enemy targets on a perpendicular axis to the friendly attacking ground force. This may force air assets to engage targets on a parallel axis to the moving ground unit creating additional control measures or the use of visual signals to assist in marking the location of friendly forces.

6-74. Aviation platforms are excellent assets for attacking and fixing enemy personnel in position. The mere presence of fixed- or rotary-wing aircraft flying in or near an enemy position is often enough to keep them from moving and exposing them to devastating fires. Enemy personnel operating in mountain terrain may be extremely reluctant to leave their positions if aircraft are flying overhead for fear of being seen or attacked.

6-75. Attack aviation aircraft are a combat enabler in a preplanned offensive operation for friendly forces seeking an engagement. Aircraft can assist in a planned operation by loitering outside of sight and sound of a known or suspected enemy position until the friendly unit makes contact. Once in contact, the on-call aircraft can quickly move on station to fix, hold, or attack enemy personnel for combined arms offensive actions. This technique creates a situation where enemy personnel are more willing to engage friendly units

initially and expose their position than if the aircraft were visible in the area at the start of the mission. (See ATP 3-04.1 for more information.)

SECTION IV – ENGINEER SUPPORT

6-76. The running estimate of the higher echelon's engineer staff officer provides the framework to synchronize and integrate engineer support into the company's mission. Conducting parallel planning of engineer support capabilities is vital in allowing engineer units to position critical assets (when available), establish linkup, and task organize to their supported units. Early linkup with supported maneuver units provides critical time for combined arms planning and rehearsal. With the assistance of available engineer support coordinated by the battalion engineer staff planner, the company commander establishes coordinated priorities of work. The priority of work (see paragraph 4-29) tasks established by the commander outline mobility, countermobility, and survivability (see paragraph 6-86 for survivability considerations) instructions for its attached and subordinate units. The commander instructs subordinates to augment and assist engineering attachments and assets to expedite maneuver in the offense and improvement of the defense. If little to no engineer support is available, the company commander must establish these same priorities early for its subordinate platoons to begin as soon as possible due to the lack of engineer assets. For example, in some instances, this may require obstacles intended to limit mobility, and survivability locations are fully prepared by organic Infantry rifle company elements.

MOBILITY

6-77. Mobility during the attack is critical. Mobility is a quality or capability of military forces which permits them to move from place to place while retaining the ability to fulfill their primary mission. Although Infantry rifle companies can cross almost any terrain, supporting and sustaining forces cannot. There are considerations to aiding movement and maneuver.

BREACHING OPERATIONS

6-78. Ensure adequate mobility support is task organized well forward during the approach to the objective to support breaching requirement and retain the ability to mass engineers or organic breaching force to support breaching operations and support assaulting forces with engineers when available to breach enemy protective obstacles. Ensure adequate guides, traffic control, and lane improvements to support movement of follow-on forces and sustainment vehicle traffic.

NAVIGATING OBSTACLES

6-79. Plan for adjustment of the breach location based on the latest obstacle intelligence and ensure information on obstacles receives immediate company-wide dissemination, including fire support, protection, sustainment platforms, and units.

6-80. Always search for a bypass to an obstacle and maintain direct observation of the obstacle throughout the breaching operation and use situational obstacles for flank security.

6-81. When the company is unable to bypass an obstacle in mountain terrain, the commander considers the enemy's strengths and obstacles to determine when and where to conduct a breach. The size of the enemy force overwatching the obstacle drives the size of the attacking force and the arraying of combat power. The commander considers the enemy's ability to mass combat power, reposition forces, or commit the reserve. The commander then develops a scheme of maneuver to mass sufficient combat power at an enemy weakness. The scheme of maneuver identifies the focus of the main effort. The location selected for breaching and penetration depends largely on a weakness in the enemy's defense where its covering fires are limited.

6-82. When planning an area defense, the commander identifies the mobility requirements by analyzing the scheme of maneuver, counterattack options, reserve planning priorities, fire support, protection, sustainment movement requirements, and adjacent and higher unit mission, movement and maneuver. The commander with the assistance of attached engineers (if available) integrates analysis into the obstacle plan while avoiding the impediment of friendly maneuver when possible. Because the bulk of the engineer force is committed to countermobility and survivability during preparation, the commander uses clear obstacle restrictions on specific areas within the AO to maintain mobility. Mobility support linkup and coordination

plays a critical role in the overall defensive preparation timeline. (See ATP 3-21.10 for additional information.)

COUNTERMOBILITY

6-83. *Countermobility* is a set of combined arms activities that use or enhance the effects of natural and man-made obstacles to prevent the enemy freedom of movement and maneuver (ATP 3-90.8). Primary purposes of countermobility operations are to shape enemy movement and maneuver and to prevent the enemy from gaining a position of advantage. In support of the area defense in compartmentalized mountain terrain, countermobility operations are conducted to disrupt enemy attack formations and assist in defeating the enemy in detail. Where subordinate units are defending in distributed positions, countermobility operations channel attacking enemy forces into EAs throughout the depth of the defense and protect the flanks of friendly battle positions and counterattack forces. Countermobility operations shape engagements, maximize the effects of fires, and provide close in protection around defensive positions to defeat the final assault of the enemy and to prevent and warn of intrusion into critical support area sites and fixed sites such as bases. (See ATP 3-21.10 for additional information.) The commander's concept of operations for engineer support will include the following tasks:

- Site obstacles.
- Construct, emplace, or detonate obstacles.
- Mark, report, and record obstacles.
- Maintain obstacle integration.

Note. See ATP 3-21.8 for information on the types and employment of friendly obstacles.

SECTION V – PROTECTION

6-84. Commanders and subordinate leaders ensure adequate protection measures are always in effect. During Infantry small-unit operations, the ability to protect the force often depends on movement being undetected by the enemy. In mountainous terrain, small units depend heavily upon the terrain for protection from enemy fire. Once the force makes contact with the enemy, subordinate leaders maneuver their units to execute the appropriate action on contact.

6-85. As the Infantry rifle company conducts survivability operations within the limits of its capabilities, engineer and chemical, biological, radiological, or nuclear (CBRN) assets provide additional capabilities to support survivability operations in support of the company. The synchronization and integration of area security (see paragraph 5-147) and local security tasks are essential to protecting the force. When attached in a direct support role, air defense assets can increase protection for command posts (CPs). Air defense assets may provide security to maneuver and sustainment units and position to overwatch key air and ground routes or avenues of approach. Additional protection tasks discussed in the section include detention operations, personnel recovery, and operations security. (See ATP 3-21.10 for additional information.)

SURVIVABILITY

6-86. Survivability operations enhance the ability to avoid or withstand hostile actions by altering the physical environment. In the offense, the emphasis is on force mobility; therefore, camouflage and concealment play a greater role than other types of survivability operations such as constructing protective positions for vehicles and weapons systems.

6-87. Because the battalion and company defend to conserve combat power for use elsewhere or later, commanders must secure friendly forces within an AO. While in an assembly area, each unit is responsible for its own protection activities, such as local security. The commander enables security, by means of providing information about the activities and resources of the enemy, through the employment of reconnaissance forces and surveillance assets within the assigned AO.

6-88. Engineer support to survivability operations is a major portion of the enhance protection line of engineer support and the integration of survivability priorities for critical systems and units within the defense. Engineer support is often required to assist in protection measures by construction and hardening of

positions in mountain operations. Engineers can turn a piece of rocky, hard, and uneven terrain into a suitable location for the establishment of a base or a landing zone (LZ). Engineers are often required to perform duties during construction of a hardened position and other vertical or horizontal construction efforts and have the heavy-duty equipment to clear areas and lift heavy construction materials. Established operating bases such as a combat outpost have increased protection from direct and indirect fires through the construction of berms, barriers, fences, control points, guard towers, and compound walls and overhead cover emplaced by engineers. Before assigning a strong point battle position mission, the commander ensures that the strong point force has sufficient time and resources to construct the position, which requires significant engineer support.

LOCAL SECURITY

6-89. *Local security* is the low-level security activities conducted near a unit to prevent surprise by the enemy (ADP 3-90). Area security activities take advantage of the local security measures performed by all units (regardless of their location) in an AO, and all local security activities should be linked to the broader area security activities. Local security is closely associated with unit protection efforts (see ADP 3-37). Local security includes local measures that prevent or interdict enemy efforts. Local security is an enduring priority of work, is essential to maintaining initiative, and prevents units from being surprised. Local security is especially important in operational environments associated with high altitudes, rapidly changing climatic conditions, and rugged terrain to avoid detection and to deceive the enemy about friendly actions, positions, and intentions. Local security includes finding any enemy forces in the immediate vicinity and knowing as much about their positions and intentions as possible.

6-90. Local security can be part of the sustaining base or part of the area infrastructure. Local security protection ranges from echelon headquarters to reserve and sustainment forces using active and passive measures to provide local security. Active patrolling, unit standard operating procedures (SOPs), and continuous reconnaissance are active measures that help provide local security. Passive measures include using camouflage, movement control, noise and light discipline, proper communications procedures, ground sensors, night vision devices, and daylight sights. (See Maneuver Center of Excellence echelon-specific Army techniques publications for echelon-level discussions.)

CHEMICAL, BIOLOGICAL, RADIOLOGICAL, OR NUCLEAR DEFENSE

6-91. Mountainous and cold weather environments present unique challenges for CBRN operations. CBRN defense measures seek to assess, protect against, and mitigate CBRN hazards and include active and passive defensive measures. An effective CBRN defense, anticipates rapidly changing climatic conditions and utilizes rugged terrain to avoid detection and protect the force. Maintaining an operational tempo that complicates enemy or terrorist targeting can be difficult in mountainous terrain particularly during cold weather conditions.

6-92. Friendly CBRN assets support survivability through CBRN R&S and decontamination. CBRN R&S assets conduct R&S of likely locations for CBRN hazards to enable units to avoid contamination when possible. When avoidance is not desirable or possible, operational and thorough decontamination techniques allow forces to continue operations in contaminated environments. (See ATP 3-21.10 for additional information on CBRN defense measures.)

AIR AND MISSILE DEFENSE

6-93. Offensive and defensive air and missile defense planning considerations continue to apply to Infantry units during operations in mountainous and cold weather environments, like any other environment. Air and missile defense sensors and command and control (C2) elements external to the IBCT provide early warning against aerial and missile attack and populate the IBCT's common operational picture. Soldiers train in aircraft recognition and ROE due to multiple factions using the same or similar aircraft, to include international and private organizations employing their own or charter civilian aircraft and groups 1 and 2 UASs. (See ATP 3-01.8 for additional information on air and missile defense and ATP 3-01.81 for additional information on counter-UAS measures.)

Note. See ATP 3-01.15 for information on the tactics, techniques, and procedures (TTP) for an integrated air defense system. See ATP 3-01.50 for information on the operations of the air defense and airspace management cell within the brigade combat team fire support cell. (See FM 3-96 for additional information.)

6-94. Counter-rocket and artillery batteries, and counter-mortar firing elements may be in or near the IBCT's AO to support its operations. Battery sensors detect incoming rockets, artillery, and mortar shells and may be used to detect groups 1 and 2 UASs. The battery's fire control system predicts the flight path of incoming rockets and shells, prioritizes targets, and activates the supported AO's warning system according to the established ROE. Exposed elements within the AO can then take cover and provide cueing data that allow the battery's weapon system to defeat the target before the target impacts the area. The commander clearly defines command and support relationships between counter-rocket, artillery, and mortar elements and the IBCT during planning. (See ATP 3-01.60 for additional information on counter-rocket, artillery, and mortar fires and ATP 3-01.81 for additional information on counter-UAS measures.)

6-95. Commanders and subordinate leaders ensure all passive and active air defense measures are well planned and implemented, to include scanning for any hostile small-UAS. See 07-PLT-D8015 (*Battle Drill-React to Aircraft While Dismounted–Platoon*) Passive measures include use of concealed routes and assembly areas, movement on secure routes, marches at night, increased intervals between elements of the columns, dispersion between Soldiers, using terrain to mask movement, and slowing or stopping movement to eliminate dust signature. Air guard duties assigned to specific Soldiers during dismounted (or mounted) movements and marches give each a specific search area. For movements and marches, seeing the enemy first gives the unit time to react. Leaders understand that scanning for long periods decreases the Soldier's ability to identify enemy aircraft. During extended or long movements and marches, Soldiers are assigned air guard duties in shifts. Units take passive measures unless or until threat aircraft are within range of assigned or attached weapons, at which time when threatened they take active measures. Active measures primarily involve engaging threat aircraft with a high volume of fires with the appropriate lead applied. Active measures include use of organic and attached weapons according to the operation order and unit SOP. (See ATP 3-21.8 and ATP 3-21.10 for additional information on movements and ATP 3-21.18 for additional information on marches.) Additional passive air defense measures include—

- Use of cover and concealment for stationary vehicles.
- Use of camouflage to conceal reflective surfaces.
- Use of cover and concealment during temporary stops and extended halts.
- Use of prepared positions when possible.
- Non-engagement of passing aircraft unless it assumes an attack profile.
- Establishment of air warning system.
- Establishment of immediate action drills.

COUNTERING UNMANNED AIRCRAFT SYSTEM THREATS

6-96. Companies and below take the concept of protection developed at battalion and implement it. Their main focus during troop leading procedures is reacting to air contact battle drills. Leaders at company and below conduct rehearsals and examine their unit's active and passive measures. Rehearsals check things such as air guard locations, assigned sectors, UAS reporting procedures, communication plans, air defense warning status, weapons control status (WCS), engagement criteria, and threat UAS identification.

Note. The company commander and its subordinate leaders should assume the company is being observed by the enemy through reconnaissance forces, surveillance assets, and targeting systems, and not assume they are under a protective umbrella of friendly air and missile defense units. UASs (both military and civilian off the shelf) are everywhere and accessible to any one individual or organization. While not all hostile air threats require engagement using air defense measures from air and missile defense units, there is still a requirement to detect, identify and be prepared to counter and defeat all classes of UASs. (See ATP 3-01.81 for classifications and additional information on counter-UASs.)

6-97. Understanding that planning is the first step toward effectively countering UAS threats. Neutralizing the UAS threat requires a combined arms approach that employs capabilities from all the warfighting functions. Effective planning synchronizes activities across echelons and warfighting functions to ensure complementary and redundant capabilities. Planning considerations are part of a coherent planning structure that includes—

- Layered approach.
- ROE.
- Airspace control.
- Air defense warning condition.
- WCS.
- Early warning network.
- Prioritized protection list.
- Warnings.

LAYERED APPROACH

6-98. A layered defense provides multiple engagement opportunities, ideally beginning at the maximum range from friendly forces and areas, and before any attacking UAS can release its weapons. A layered defense normally includes support by necessary space, surface, and airborne early warning, detection and tracking assets.

RULES OF ENGAGEMENT

6-99. Commanders have the responsibility to take whatever action is necessary to protect their forces and equipment against attack and ensure their Soldiers operate in accordance with established ROE. A unit can push engagement authority of threat system UAS lower, but they balance the risks of a quicker response with the potential for fratricide.

AIRSPACE CONTROL

6-100. Divisions and brigades distribute the airspace coordination order, the unit airspace plan, and the current air picture via C2 systems that subordinate units have access to. This includes systems such as the CP computing environment or the joint battle command-platform. Not all brigades and battalions have access to the tactical airspace integration system which is the C2 system that manages the air picture, forward area air defense C2, or air and missile defense early warning systems. Subordinate units without air defense and air management cells or access to these systems, are not capable of maintaining awareness of the current friendly air picture and rely on those echelons with those systems to share and create products they can use.

AIR DEFENSE WARNING CONDITIONS

6-101. Air defense warning condition is an air defense warning given in the form of a color code corresponding to the degree of air threat probability. Warning conditions are a procedural control used to prepare units based on the assessed threat. Different conditions can be provided for different air threats. Commanders may issue higher, but not lower, conditions for their assigned area. Leaders ensure that every Soldier knows the current air defense warnings.

WEAPONS CONTROL STATUS

6-102. WCS is a control measure that establishes the conditions under which air defense weapons (including small arms and crew served weapons) are permitted to engage threats. WCSs can apply to weapon systems, volumes of airspace, or types of air platforms. The tactical situation normally determines the degree or extent of control necessary over weapon systems. The brigade air and missile defense cell either establishes separate WCSs for various air threats, including fixed and rotary-wing aircraft, and UASs or an overall control status for any threat air engagement. The three WCSs for counter-UASs are—

- Weapons free:
  - Engage any UAS that is not positively identified in accordance with ROE as friendly.
  - This is the least restrictive weapon control status.
- Weapons tight—UASs are engaged only when identified as hostile in accordance with ROE.

- Weapons hold:
  - Units may fire only in self-defense or when ordered by proper higher authority.
  - This is the most restrictive weapon control status.

EARLY WARNING NETWORK

6-103. As part of their counterreconnaissance efforts, all units establish an air threat early warning network. This network is usually over frequency modulation and is a means of sharing air threat situational understanding for units without dedicated air defense C2 systems. These networks alert everyone. Units practice relaying information using this network to reduce the time required to notify everyone.

PRIORITIZED PROTECTION LIST

6-104. Normally, the company receives a prioritized protection list (developed at brigade and battalion echelons) to help prioritize the use of assigned or allocated protection capabilities. The prioritized protection list provides focus on defending critical assets such as C2 nodes or logistics areas as part of the overall protection plan. Critical assets can be people, property, equipment, activities, operations, information, facilities, or materials.

WARNINGS

6-105. Once an air threat is detected, all friendly forces need to be quickly warned. This can happen by two methods-a top-down approach, or a bottom-up approach. Small UASs are typically detected by forward units first, so rehearsing the use of the unit early warning net and rehearsals from the bottom-up are critical. No matter which approach is used, the information is passed using the size, activities, location, unit, time, and equipment (also called SALUTE) report format. Receipt of this report should trigger additional follow-on actions for all units. These follow-on actions could be for units to freeze in place or engage with lethal or non-lethal means. When possible, units detecting air threats alert adjacent units. Table 6-1 shows some additional information to collect on unknown UAS and to include in a SALUTE report. (See ATP 3-01.81 for additional information.)

Table 6-1. Counter-unmanned aircraft system detection report (SALUTE format), example

Line	*Information*	*Example*
1	Size	Report the number of unmanned aircraft systems (UASs), or size of the formation.
2	Activity	Report a detailed account of actions: • What is the UAS's direction of movement? • Was there any hostile action? • Is the threat UAS loitering in one spot? • Is it flying straight? • Was the threat UAS approach observed or was it spotted overhead?
3	Location	Report where the activity was seen. Include 6- to 8-digit grid coordinate of reporting element and either grid or distance and direction from reporting element location (known point).
4	Unit (Description of UAS)	Include details such as— • Fixed-wing or rotor/multi-rotor. • If fixed wing, include— ▪ Estimated length of wingspan. ▪ Tail configuration. • If rotor/multi-rotor, include— ▪ Number of rotors. ▪ Height. ▪ Payload, sensors, and weapons. ▪ Any lights. ▪ Other distinguishable markings.
5	Time	Report the time the activity was observed.
6	Equipment	If possible, report all equipment associated with the UAS, such as payload or weapons.

CAMOUFLAGE, NOISE, LIGHT DISCIPLINE, AND EMISSIONS CONTROL

6-106. The Infantry unit is visible to enemy forces and target acquisition capabilities on every spectrum, including visible light, sound, and across the electromagnetic spectrum. Units must take steps to eliminate or minimize all these signatures to prevent targeting. Natural or artificial materials may be used as camouflage to confuse, mislead, or evade the enemy. Leaders ensure all elements abide by strict execution of noise (this includes carried equipment) and light discipline and emissions control (for example, thermal and electronic). Infrared lights can provide additional illumination when necessary; however, peer threat forces can easily detect it. Radios and other C2 systems all emit detectable signatures and must be used carefully; for instance,

minimizing transmissions, reduced power settings, masking signals with terrain, and so forth, can help reduce the likelihood of detection. Cell phones must not be used under any circumstances. (See ATP 3-21.8 for a detailed discussion.)

ADDITIONAL PROTECTION TASKS

6-107. Infantry small-unit commanders and subordinate leaders must take measures to protect against all acts designed to impair the unit's effectiveness and prevent the enemy from gaining an unexpected advantage. Commanders and subordinate leaders must secure the force during offensive and defensive operations to conserve combat power for use elsewhere or later. Infantry small units ensure security by employing reconnaissance and security forces and surveillance assets throughout the depth and breadth of its assigned AO. Commanders may employ counterreconnaissance, combat outposts, a screen or guard force, and other security operations tasks to provide this security. Information related capabilities and cyberspace electromagnetic activities aid in securing the force and confuse the enemy as to the manner of offense or defense. Additional protection tasks in support of mountain and cold weather operations, although not inclusive, may include detainee operations, personal recovery, area security (see paragraph 5-147), and operations security. (See ADP 3-37 for additional information.)

DETAINEE OPERATIONS

6-108. Detainees and captured enemy equipment or materiel often provide excellent combat information. This information is of tactical value only if the unit processes and evacuates detainees and materiel to the rear quickly. In all tactical situations, the unit will have specific procedures and guidelines for processing detainees and captured materiel. As a matter of policy, all detainees are treated as enemy prisoners of war until their appropriate legal status is determined by a competent authority according to the criteria enumerated in the Geneva Convention Relatives to the Treatment of Prisoners of War. However, as a practical matter, when a unit captures enemy personnel, they must provide the initial processing and holding for detainees. (See ATP 3-21.8 for additional information.)

CONDUCT PERSONNEL RECOVERY

6-109. Commanders conduct contingency planning and coordinate actions to be taken for the potential of missing personnel (commonly called duty status whereabouts unknown) to expedite personnel recovery in the event it happens. Contingency planning and coordination cover immediate actions to recover missing personnel. Examples of these actions may include securing avenues an enemy may use to flee with kidnapped friendly personnel, clearing operations that clear an area of known enemy and facilitate locating personnel gone missing, and coordination or communication outside of the unit to expedite recovery. (See ATP 3-21.10 for additional information.)

IMPLEMENT OPERATIONS SECURITY

6-110. Operations security contributes to the company's ability to achieve surprise during all operations, thus enabling its chances for success. Within the company AO, human adversaries/enemies monitor the company's normal activities to detect variations in activity patterns that forecast future operations. They monitor the conversations of Soldiers, both on duty and off duty, to gain information and intelligence. Adversaries/enemies monitor commercial internet activity and phone calls from company operational and recreation facilities. They will look at trash created by company activities. The absence of operations security about company activities contributes to excessive friendly casualties and possible mission failure in area security operations just like it does in combat operations. Information superiority hinges in no small part on effective operations security; therefore, measures to protect essential elements of friendly information cannot be an afterthought. (See ATP 3-21.10 for additional information.)

SECTION VI – SUSTAINMENT

6-111. Sustainment functions in mountain environments, constrained by altitude and harsh weather, are one of the biggest challenges to leaders and are often a difficult and time-consuming process. In mountain operations, Infantry small units battle terrain and weather conditions as well as the enemy. High altitudes and

harsh weather conditions complicate Soldier load, medical considerations, and logistics resupply. Soldier and unit equipment may not function, or functions marginally, under these conditions.

EFFECTS ON SOLDIERS

6-112. Practically every aspect of mountain operation is affected more than if the same operations were conducted at lower altitudes in more forgiving terrain and weather conditions. Rock formations can be steep, craggy, jagged, and unforgiving during dismounted operations with heavy loads. The physical effects of high altitudes over difficult terrain quickly exhaust Soldiers and significantly reduce their physical effectiveness and cognitive capacity to accomplish assigned tasks. Small-unit mountain operations in higher altitudes and extremely cold temperatures make tasks more difficult to accomplish, though it does not make them impossible with proper training and conditioning specific to the AO.

SOLDIER LOAD

6-113. Soldier load is a leader responsibility regardless of the operating environment. Mountain terrain taxes Soldier strength and tests Soldier endurance even more, making the scrutiny of Soldier load even tighter. Even though conditions experienced during mountain operations are more difficult than in more forgiving terrain and climate conditions, a Soldier is often required to increase the load as opposed to decrease it.

6-114. The fighting capability of an Infantry Soldier relates directly to the load the Soldier carries. A maximum individual load limit is established and not exceeded if an Infantry Soldier is to accomplish an assigned combat mission. Commanders and subordinate leaders consider multiple factors in the Soldier load-planning process. (See ATP 3-21.18, chapter 3 for a detailed discussion on Soldier load.)

Load Considerations

6-115. A Soldier's load is based on the weight of the Soldier, the climate, the terrain, and the stress the Soldier has faced or is currently facing. Heavy loads, mountain terrain, high altitude, and extremely hot or cold weather all combined decreases a Soldier's strength.

6-116. Prior to initiating the mission with definitive items that compose the Soldier's load, the leader considers the environment, weather, mission purpose and duration, and Soldier requirements. Each mission requires an analysis of the essential items that are necessary for combat operations and survival.

6-117. Vehicles will not always be available to carry ammunition, food, and equipment in the mountains but considered for use whenever practical.

6-118. Combat load (see paragraph 5-223) decisions, to improve the likelihood of mission accomplishment, on items such as the amount of food and water taken as well as the configuration of body armor are determined through the risk management (RM) process (see paragraph 2-34). Understanding the operation, including the senior commander's intent and risk tolerance, and residual risk for the mission helps leaders make informed decisions to reduce or offset risk.

6-119. While assault packs vary by role or function within the unit, leaders determine their exact contents during mission analysis.

6-120. To assist in managing Soldier load, leaders do the following:

- Conduct precombat checks (PCCs) and precombat inspections (PCIs).
- Consider using the memory aid DROP: D—decide mobility level, R—reduce unnecessary gear, O—organize resupply methods, P—police the ranks (inspect).

Load Planning for a Properly Conditioned Soldier

6-121. The fighting load (see paragraph 5-224) should average between 60 to 80 pounds (ideally about 30 percent of a Soldier's body weight). The approach march load (see paragraph 5-225) should average between 80 to 100 pounds (ideally about 45-percent of a Soldier's body weight) including all clothing and equipment, either worn or carried. The emergency approach march load (see paragraph 5-226) should average between 100 to 125 pounds.

Overload Consequences

6-122. Overloading Soldiers can expose them to extreme risk. No amount of training changes the body's reaction to carrying excessive loads. The leader's involvement in analyzing the situation and the level of risk involved is the key to determining what is mission essential. Unit SOPs should limit what is carried on combat operations and enforce those limits.

6-123. Inexperienced or new Soldiers to mountain operations may attempt to pack and carry more equipment than needed increasing the physical strain on their body and exhausting them more quickly. This not only affects individual performance but unit performance as well.

Environmental Impacts

6-124. While season, climate, and weather conditions impact on items carried in mountain operations, Soldiers should be equipped for sudden weather changes as is characteristic of mountain environments.

6-125. Mountain terrain is usually rocky, making it very easy to twist an ankle or otherwise have a minor to moderate lower body injury with heavy loads. Injuries tend to increase in the winter due to the water, snow, and ice. Even in the most benevolent terrain, fatigue can become an issue. With rough mountain terrain and bad weather, the effects of fatigue multiply exponentially. Without proper rest, fatigue can greatly reduce the effectiveness of an otherwise highly trained unit.

6-126. Leaders plan contingencies for additional resupply (see ATP 3-21.10 for more information on contingency resupply). When required, this can include a means for purifying mountain spring or stream water.

Immediate Effect of High Altitude on Soldiers

6-127. The immediate effect of high altitude on Soldiers is increased breathing and heart rate. This contributes to a perceived increase in exertion and shortness of breath. In simple terms, each breath an individual takes at a high altitude has less oxygen in it than at a low altitude. The reduction in available oxygen decreases a Soldier's ability to function adequately. Tasks, requiring moderate to high exertion for several minutes or longer, become harder to sustain and fatigue develops more quickly. Recovery from physical fatigue is slower. At high altitudes above 3,000 meters (10,000 feet) vision, and judgment are impaired and sleep becomes irregular. Over time, an individual can improve their ability to function adequately by becoming "acclimatized" to the environment. Acclimatization allows for extended operations at high altitudes.

6-128. While all Soldiers should maintain a high standard of physical readiness and conditioning, troops scheduled to conduct operations at high altitudes should endure an acclimatization process to be effective and help prevent associated high-altitude injuries. Mountain-warfare training is not a substitute for the acclimatization process. While stateside acclimatization is possible, de-acclimatization is likely if transport times to theater exceed more than a few days and troops must acclimate in theater.

6-129. Acclimatization is required before undertaking extensive military operations. The expectation that freshly deployed, non-acclimated troops can go immediately into action is unrealistic and could be dangerous. Even the most physically ready Soldier experiences physiological and psychological degradation when thrust into high elevations. Commanders understand these constraints and allocate time for acclimatization and conditioning, and the training of Soldiers. No shortcuts exist for the acclimatization process and any attempt to trim or bypass the process will usually result in personnel injuries. The duration of the acclimatization process depends on the altitude at which the unit must operate. Soldiers continue to train during the acclimatization process. Components of the acclimatization process and training include crossing crevasses, foot marches, weapons firing, and rock climbing.

6-130. Generally, most Soldiers can operate in mountains up to 2,400 meters (8,000 feet) with minimal effects; others may take more time to compensate. Acclimatization for mountain operations between 2,400 and 4,200 meters (8,000 and 13,800 feet) usually takes about 1 to 2 weeks on average and for operations above 4,200 meters another 2 weeks is recommended. Acclimatization for higher altitudes is lengthy and rigid and cannot be shortened without serious consequences. Acclimatization for altitudes above 5,200 meters

(17,000 feet) is generally not possible for many personnel, though ground troops rarely operate at these heights.

MEDICAL CONSIDERATIONS

6-131. One of the most important factors affecting small-unit mountain operations is the effects of altitude and harsh weather on the execution of the Army Health System. In addition to the effect it has on all units, Soldiers, and equipment, such as disrupting transportation, reducing visibility, or deteriorating equipment/reducing shelf life of parts, these affects can shape the character, frequency, and severity of injuries to patients. From a medical perspective, different terrain features will influence the types and severity of wounds incurred; the medical equipment and supplies required to treat injured or wounded Soldiers; the way medical evacuation (MEDEVAC) operations can be conducted; and the length of time required to evacuate the wounded or injured Soldiers. (See ATP 4-02.2 for additional information.)

6-132. MEDEVAC and casualty evacuation (CASEVAC) have positive impacts on morale. *Medical evacuation* is the timely and effective movement of the wounded, injured, or ill to and between medical treatment facilities on dedicated and properly marked medical platforms with en route care provided by medical personnel (ATP 4-02.2). *Casualty evacuation* is the movement of casualties aboard nonmedical vehicles or aircraft without en route medical care (ATP 4-02.13). Casualties are cared for at point of injury or under nearby cover and concealment and receive self or buddy aid, combat lifesaver, or combat medic.

6-133. During planning, commanders and subordinate leaders (in coordination with unit CASEVAC procedures) outline procedures for MEDEVAC. Key MEDEVAC considerations include—

- Ensuring organic medical personnel accompany each march element.
- Coordinating air and ground MEDEVAC support.
- Rehearsing MEDEVAC operations with air ambulance flight crews.
- Rehearsing MEDEVAC operations with ground ambulance crews, specifically route clearance.
- Placing ground ambulances strategically in direct support of each march element.
- Identifying ambulance exchange points along march routes.

6-134. In situations in which MEDEVAC assets are either limited in number or unavailable, commanders must plan to conduct CASEVAC operations. These are usually accomplished with organic vehicles. In situations in which organic vehicles are not available it may be necessary to request vehicles from supporting units. Additional CASEVAC planning considerations may include—

- Rehearsing CASEVAC operations with designated CASEVAC platform crews.
- Identifying equipment to be carried by designated Soldiers in each march element including:
  - Compact and lightweight casualty transport systems.
  - VS-17 panels or other marking equipment including night marking devices.
  - Mobility equipment such as rope and carabineers when applicable.

Altitude Sickness

6-135. High altitudes can also cause altitude sickness. Altitude sickness, caused by body fluids leaking from the blood vessels into the tissues, mostly affects a Soldier's brain and lungs. The most common altitude sickness is acute mountain sickness (AMS). AMS symptoms are headache, nausea, vomiting, dizziness, fatigue, and sleep disturbances. AMS is common (over 20-percent incidence) above 2,400 meters (8,000 feet) and both the incidence and symptom severity increase with higher altitudes.

6-136. In addition to AMS, the much less frequent but potentially life-threatening altitude sicknesses include high-altitude pulmonary edema and high-altitude cerebral edema. Symptoms of high-altitude pulmonary edema include severe shortness of breath, frothing at the mouth and cyanosis (blue color of skin). High-altitude cerebral edema symptoms include severe headache, stumbling, confusion, and incoherent speech.

6-137. All leaders and Soldiers should know physical and mental changes in personnel that may be symptomatic of these illnesses. The most effective treatment for all altitude sickness is descent and rest. Soldiers well-acclimatized to high altitudes are less susceptible to developing altitude sickness. (See ATP 3-90.97 and TB MED 505 for more information on altitude acclimation and illness management.)

6-138. During mountain operations, leaders consider the following in relation to the effects altitude may have on Soldiers:

- Low altitude—0 to1,000 meters (0 to 3,300 feet) has no effect.
- Moderate altitude—1,000 to 2,400 meters (3,300 to 8,000 feet):
  - Little to no effect.
  - Effects on Soldiers usually start around 2,400 meters (8,000 feet).
- High altitude—2,400 to 4,200 meters (8,000 to 14,000 feet):
  - Slower movement/performance.
  - Judgment and cognitive skills may be affected.
  - AMS (headache, nausea, dizziness).
  - 300 meters (1,000 feet) per day above 3,000 meters (10,000 feet) to acclimatize.
  - Mandatory and immediate evacuation for high-altitude pulmonary edema, high-altitude cerebral edema 3,700 meters plus (12,000 feet plus).
  - 50- to 80-percent ineffective at 4,200 meters (14,000 feet) from sea level.
- Very high altitude—4,200 to 6,000 meters (14,000 to 19,800 feet):
  - Mandatory acclimatization (1 to 2 days for every 1,000 feet above 10,000 feet).
  - High-altitude pulmonary edema/high-altitude cerebral edema increases in severity and incidence.
  - Limited time at elevation (deterioration).
  - Highly experienced and trained personnel.
  - Specialized equipment.
- Extremely high altitude—Above 6,000 meters (19,800 feet):
  - Weeks of acclimatization.
  - No air assets above 5,500 meters (18,000 feet).
  - Highly experienced and trained personnel.
  - Specialized equipment.

Temperature Effects

6-139. Higher elevations come with colder temperatures. Temperature and humidity decrease with increasing altitude. As the body becomes accustomed to the cold temperatures, Soldiers can also become more adapted and efficient in functioning in a cold environment. Cold injuries, both freezing and nonfreezing, are generally the greatest threat at high altitudes. Frostbite and snow blindness are common injuries associated with the cold. Exertion causes the body to sweat which, in very cold temperatures, can freeze and possibly result in frostbite. Reviewing cold weather injury prevention, training in shelter construction, dressing in layers, and using the buddy system are critical and may preclude large numbers of debilitating injuries. The four essential requirements for survival in cold weather include warmth, food, water, and shelter.

6-140. Altitude sickness and cold injuries can occur simultaneously, with signs and symptoms being confused with each other. Leaders evacuate coughing, stumbling Soldiers immediately to medical support at lower altitudes to determine their medical condition. Likewise, Soldiers in extreme pain from cold injuries who do not respond to normal pain medications, require evacuation. Without constant vigilance, cold injuries may significantly limit the number of deployable Soldiers and drastically reduce combat power. With command emphasis and proper equipment, clothing, and training, most cold-weather injuries are preventable. (See TC 4-02.1 for more information on cold injury causes, symptoms, treatment, and prevention.)

6-141. Sun, heat, and warmer weather in the mountains can be a cause of injury. Atmospheric conditions make it easier for personnel to be sunburned. Warmer temperatures can melt snow and create snow slides or avalanches. Heat-related injuries could be common in the mountains especially among Soldiers conducting long-term strenuous activities such as climbing with heavy loads. These type intense physical activities in the summer months, in direct sunlight, on hot humid days can increase the body's internal temperature. At some point, the body may lose its ability to get rid of the excess heat to compensate for these increases. When this happens, dehydration, heat exhaustion, or heat stroke may occur. (See TC 4-02.1 for more information on these types of illnesses.)

Combating Extreme Temperature Effects

6-142. Leaders need to be aware of the symptoms that characterize a unit having difficulty coping with extreme temperatures. Paragraphs 6-143 through 6-148 suggest ways to help combat the effects of extreme temperatures when it begins to affect the minds of Soldiers:

6-143. When Soldiers find it hard to remember things, leaders show patience and review orders and drills. Leaders get their Soldiers to think through the challenges of the environment and the mission and encourage them to ask questions. Keeping their minds busy is beneficial.

6-144. Leaders are alert for Soldiers who tend to withdraw from the group's focus and keep them involved. Soldiers who withdraw into themselves are paired in a buddy system with Soldiers already acclimatized to the environment. Soldiers are reminded that everyone is in the same situation, including the enemy. If Soldiers get depressed, moody, or blue, and do not want to talk, leaders encourage them to chat with each other. Leaders also circulate among the troops in their duty areas and keep them talking and interacting.

6-145. If Soldiers become irritable and get on each other's other's nerves, leaders are reminded that this is likely to happen. Leaders also maintain a sense of humor, show patience, and vary their Soldiers' duties.

6-146. Leaders should be aware that Soldiers may tend to shirk from some tasks. Leaders remind Soldiers that their job is to fight and to keep their weapons and equipment in fighting order, not accepting that the temperature as an excuse for not carrying out routine tasks. It may be the reason for taking longer, but it is not a reason for letting things slide. Although the extremely cold or hot temperatures may make tasks more difficult to accomplish, it does not make them impossible.

6-147. The frequent rotation of Soldiers into warming tents or areas to provide relief from the cold and provide warm liquids (non-caffeine) are planned at frequent intervals and provide extra insulating material for individuals, when available. Leaders ensure Soldiers remain hydrated both in cold and hot temperatures.

6-148. As a rule, leaders need to add an additional one-third of the normal time needed to any task performed in extreme cold weather from starting vehicles to operating weapons.

Heat and Cold Weather Injuries

6-149. Leaders should routinely check Soldiers to enforce procedures for preventing temperature-related injuries. (See ATP 3-90.97 and TB MED 507 for a thorough explanation of heat- and cold-related injuries.) Common heat and cold weather injuries include—

- Heat:
  - Heat cramps.
  - Heat exhaustion.
  - Heat stroke.
- Cold:
  - Hypothermia.
  - Frostbite.
  - Chilblain.
  - Immersion syndrome.
  - Snow blindness.
  - Sunburn.
  - Dehydration.
  - Constipation.
  - Carbon monoxide poisoning.
  - Tent eye.

Casualty and Medical Evacuation

6-150. CASEVAC (see ATP 4-02.13) or MEDEVAC (see ATP 4-02.2) operations in mountain terrain involve many challenges. Steep terrain and adverse weather are two main factors complicating evacuation. Even relatively minor injuries can lead to serious complications at high altitudes requiring evacuation. Air evacuation is often preferred but the weather, tactical situation, and other factors may preclude its use. Evacuations may be vertical as well as horizontal requiring units and personnel to be self-sufficient in

mountain evacuation techniques. Several specialized techniques include methods for carrying sick and wounded personnel, and techniques for using ropes, manufactured litters, and rescue systems. Personnel should be familiar with how to package a patient for transport using the available systems. (See ATP 3-90.97 and ATP 4-02.2 for more information on the types of litters, rescue systems, and low- and high-angle considerations.)

6-151. During mission planning, leaders should outline procedures for CASEVAC and MEDEVAC. Key considerations include—

- Planning extrication points along the route keeping in mind the unforgiving terrain.
- Carrying at least one, preferably two, semi-rigid litters-lightweight manufactured rescue litter.
- Coordinating for air assets and ground vehicles on stand-by for assistance in transportation.
- Ensuring a medic accompanies all patrols.
- Carrying marking panels or other materials including night-marking devices.
- Carrying additional combat lifesaver bags in addition to the medic bags.
- Carrying minimal mountain mobility equipment such as rope and carabineers.
- Rehearsing nonstandard platform CASEVAC.
- Rehearsing of aero MEDEVAC hoist rescue hookup and operations with aircraft personnel.

6-152. Air evacuation remains the preferred method for transporting sick and injured personnel. Due to the dispersed nature of troops, movement assets may take some time to arrive, and expert medical help might not be readily available. Self-aid or buddy-aid, and combat lifesavers (casualty response) often are relied upon to provide medical assistance until casualties can be evacuated for higher-level treatment. Medical support in the mountains is complicated by many factors including—

- The distances to medical facilities where advanced care must be given.
- Small mobile units in independent or semi-independent combat operations in remote areas.
- Slow or impossible ground evacuation.
- Altitude, terrain, and weather restrictions that hinder or delay aerial evacuation.
- Vulnerability of ground evacuation routes to enemy ambush.

6-153. The combat medic is the first individual in the medical chain that makes medical decisions based on medical specialty-specific training. The platoon combat medic goes to the casualty and initiates tactical combat casualty care (TCCC) or the casualty may be brought to the combat medic at the casualty collection point. The medic makes an assessment; administers initial medical care; initiates the DD Form 1380 (*Tactical Combat Casualty Care [TCCC] Card*) or other requisite forms; requests evacuation; or returns the Soldier to duty.

Note. TCCC is prehospital care provided in a tactical setting. TCCC (first responder capability, see ATP 3-21.8 for a detailed discussion) occurs during a combat mission and is the military counterpart to prehospital emergency medical treatment. TCCC is divided into three stages: care under fire, tactical field care, and tactical evacuation. (See FM 4-02 and ATP 4-02.5 for additional information.)

6-154. If evacuation is necessary using either CASEVAC or MEDEVAC, the mission should be thoroughly coordinated and executed. The following items should be considered during mission execution for the evacuation:

- Ensuring scene safety and security of personnel and patient.
- Scanning the area for danger from mountain hazards as well as the enemy small-arms fire and explosive devices.
- Ensuring scene safety and security of personnel and patient.
- Scanning the area for danger from mountain hazards as well as the enemy small-arms fire and explosive hazards.
- Ensuring personnel do not become casualties themselves.
- Ensuring medical personnel attend to patient.
- Protecting the patient from the environment.
- Causing no further harm to the patient.

- Planning evacuation routes (smoothest route possible).
- Packaging patients for transport. Litters may include—
  - Improvised litters from rope, clothing, blankets, and so forth.
  - Pole-less litters.
  - Collapsible litters.
  - Lightweight manufactured rescue litter and associated equipment for airlift.
  - Basket-type.
- Ensure submission of casualty report to unit personnel staff officer.
- Ensure completion of DA Form 1156 (*Casualty Feeder Card*).

Mountain Evacuation Complications Considerations

6-155. There are preventative measures to help overcome complications in mountain evacuations such as establishing aid stations with treatment and holding capacities at the lowest possible echelon. Patients are evacuated by ground transport and held until movement by secure means is possible. Sufficient air or ground transportation is provided to move medical elements rapidly and maximize use of air evacuation, both CASEVAC and MEDEVAC, and includes both scheduled and on-call evacuation support of static installations and combat elements in the field.

6-156. Medical clinics at each base are established and run, which affords trauma–level treatment to stabilize wounded until MEDEVAC can occur.

6-157. Existing treatment and holding capabilities are established or reinforced, where patients have been unexpectedly numerous. Small medical elements are provided to augment extended combat patrols and use medical assets echelons above brigade for area medical support.

6-158. Emphasis on basic combat training of medical service personnel, arming medical service personnel, and using armored carriers for ground evacuation should be increased where feasible. Specially trained enlisted medical specialists are assigned to battalion casualty collection points for stabilizing treatment prior to the patients entering the brigade's evacuation chain.

6-159. Sanitation measures, maintenance of individual medical equipment (individual first aid kits [also called IFAKs] and combat lifesaver kits/vehicle kits), and TCCC training (combat lifesavers or equivalent) throughout the command are supervised.

6-160. Military personnel can assist the local populace by establishing clinics to in areas where there is no medical support or affordable care.

Nutrition

6-161. Soldiers require an increase in calorie and fluid intake as they move to higher altitudes. A diet high in carbohydrates is important in helping the body fight the effects of these conditions. Fats provide long term, slow caloric release but they are often unpalatable to Soldiers operating at higher altitudes. Snacking on high carbohydrate foods is often the best way to maintain the calories necessary to function.

6-162. Weight loss is characteristic of operations at high altitude that Soldiers should closely monitor. The average weight loss for a special forces team working with the high-altitude mountain school was 20 to 25 pounds while living on Pakistani rations. Their schedule included 6 days of activity, 12 hours a day, though just moving around created above normal exertion. The bottom line in working at this altitude is that personnel are going to lose weight. Weight loss should be controlled before it becomes incapacitating. Weight loss leads to fatigue, loss of strength, and psychological changes, such as decreased mental capacity and alertness, and low morale. These conditions can contribute to accidents and a failure to accomplish the mission.

6-163. To help guard against issues associated with potential weight loss Soldiers should be—

- Eating a high-complex carbohydrate diet, eating portions of the complete ration verses one item or the other.
- Eating a least one hot meal a day, using whatever heat source is available (for example, chemical heat packs).

- Eating a variety of foods and snacks.
- Drinking 4 to 6 quarts of non-caffeinated beverages a day (caffeinated beverages can be consumed in moderation).
- Monitoring the color and volume of urine for possible dehydration (dark yellow means take action).
- Not skipping meals, even in the absence of appetite (consume a little of everything in the ration).
- Not eating high fat snacks or fatty foods or consuming alcohol of any type.
- Not force-feeding (can result in vomiting and make the situation much more hazardous).
- Not drinking unpurified water or melted snow (melting snow for drinking purposes, boil or purified by other means before drinking).
- Not restricting water intake to save it for later or attempting to avoid urinating.

6-164. Significant body water is lost at higher elevations from rapid breathing, perspiration, and urination. In cold climates sweat, normally an indicator of loss of fluid goes unnoticed. Sweat can evaporate so rapidly or be absorbed so thoroughly by clothing layers that it is not readily apparent. Thirst is not a good indicator of the amount of water lost. When Soldiers become thirsty, they may be already dehydrated. Dehydration increases the risk of developing, AMS, cold injuries, and physical fatigue.

6-165. To combat dehydration issues, Soldiers should consume about 4 to 8 quarts of water or other decaffeinated fluids per day in low mountains and may need 10 quarts or more per day in high mountains depending on level of exertion. Forced drinking in the absence of thirst, monitoring the deepness of the yellow hue in the urine, and watching for behavioral symptoms common to AMS are important factors for leaders to consider in assessing the water balance of Soldiers operating in the mountains.

6-166. Leaders ensure Soldiers fill canteens as often as possible and units carry means to purify and disinfect mountain ground water. Leaders consider the use of commercial water purification systems to reduce the amount of water carried by individuals while careful considering the type of handheld water purification device used. Leaders make decisions only after applying the principles of RM, to include factors such as quality of the water treated, the duration of the mission, and the potential for existing and intentional contamination.

Hygiene

6-167. Personal hygiene should be of concern to leaders and Soldiers. Poor hygiene can lead to sickness and degradation of performance with an adverse effect on the unit as well as the Soldier. Cold temperatures found in mountain environments tend to aggravate hygiene issues. Often Soldiers neglect personal hygiene and field sanitation in cold weather. Food and water need often take precedence over personal hygiene. Because of the extremes in temperatures and lack of bathing and sanitary facilities, keeping the body clean in a cold weather environment is not an easy proposition. Still, Soldiers need to attend to hygiene in the cold weather environment. (See ATP 4-25.12 and TC 4-02.3 for a more robust sanitation technique listing.)

6-168. In cold weather mountain operations, Soldiers should shave daily and not allow hair to grow too long. A beard and longer hair add little insulation and soils clothing with natural hair oils. In winter, a beard or a mustache becomes a nuisance since it serves as a base for the build-up of ice from moisture in the breath and can mask the presence of frostbite. Shaving daily is necessary but using a blade and soap, it removes protective face oils. Soldiers should shave several hours before exposure to the elements to reduce the danger of frostbite and usually done at the beginning of the rest cycle. Shaving with an electric razor will not remove the protective oils.

6-169. Soldiers should wash their entire body weekly (at a minimum). If bathing facilities are not available, Soldiers can wash with two canteen cups of water, using half for soap and washing and half for rinsing. Soldiers should clean feet, crotch, and armpits daily. They should also clean their teeth daily. It is important that Soldiers do not use alcohol-based wipes (commonly known as baby wipes) in the field. These wipes contain alcohol that conform to the same temperature as the ambient air. If Soldiers use these products in an environment where the temperature is below freezing, then they risk contact frostbite, especially if the temperature is below 0 degrees Fahrenheit. Soldiers should change socks once per day at a minimum. If this is not possible, they should remove boots and socks, and then dry and massage feet once per day. Field sanitation and hygiene practices should include procedures for garbage, latrines, and waste management.

EFFECTS ON INDIVIDUAL AND UNIT EQUIPMENT

6-170. Leaders train Soldiers to know the problems associated with their individual and unit equipment at high altitudes and take corrective action to ensure they function properly when needed. On the average, vehicles lose 20- to 25-percent of their rated carrying capability and use up to 75-percent more fuel. Military generators and vehicles are often diesel-powered, but standard diesel engines lose efficiency at 3,050 meters (10,000 feet) and eventually stop functioning altogether because of insufficient oxygen. Lubricants freeze; altitude and weather limit helicopters; and additional animal or gasoline-fueled overland transport adds to the physical demands and logistic requirements of this environment. Leaders and Soldiers protect weapons and munitions from environmental effects to include snow and ice. Specialized equipment for individual Soldiers is often necessary and available for units deploying to mountain environments. (See ATP 3-90.97 for cold weather impacts on specific types of equipment and weapon systems.)

COLD WEATHER CLOTHING AND FOOTWEAR

6-171. In addition to standard-issue clothing for Soldiers, two versions of the extended cold weather clothing system (also called ECWCS) Generation II and Generation III are available. These systems consist of three layers including a base layer, an insulation layer, and an outer shell. The base layer (referred to as inner or wicking layers) is the layer adjacent to the body. These layers should be comfortably loose. The main purpose of these garments is to wick excess moisture away from the body. Insulation layers are the intermediate layers between the base and the outer shell. They provide volume to trap warm air between the body and the outer garments. They too help wick away excess moisture and should also be comfortably loose to trap a sufficient volume of air. The outer shell is the external layer that provides protection from precipitation and wind. In addition, it provides additional volume for trapping warm air. (See ATP 3-90.97 for additional information on these systems.)

6-172. Cold weather boots must be issued in a cold weather environment. While personnel are in static positions, they should either wear over-boots for warmth or stand on insulating material such as a pine bough or a flat piece of wood. Soldiers operating in rugged, mountainous terrain should be issued mountain boots. Leaders should understand mountain terrain requirements and that mountain boots are different in characteristics and design than a standard issue boot. Using boots with specialized tread designs engineered for climbing and traversing rough terrain have become a standard practice for many units. Other types of equipment, such as a strap on foot traction devices, aid in movement across ice and snow are also available.

Cold Weather Clothing System Design Principles

6-173. Insulate—insulation allows the creation of a microclimate around the body through which the amount of body heat lost to the environment can be regulated. By varying the amount of insulation, a Soldier can regulate the amount of heat lost or retained.

6-174. Layer—several layers of clothing provide more insulation and flexibility than one heavy garment, even if the heavy garment is as thick as the combined layers. By adding or removing layers of clothing (insulation), the Soldier can regulate the amount of heat lost or retained.

6-175. Ventilate—ventilation helps maintain a comfortable microclimate around the body, thereby helping control body temperature. By ventilating, the Soldier can release excess heat and minimize sweating, which can lower body temperature later as it evaporates.

Cold Weather Clothing System Operations Military Principles

6-176. The steps in paragraphs 6-177 through 6-181 may be remembered by the memory aid COLD R.

6-177. Clean—clothing should be kept clean. Dirt and grease clog the air spaces in clothing and reduce the insulating effect. Dirty clothes are cold clothes.

6-178. Overheating—overheating should be avoided. Select the clothing needed to stay comfortable, or even a little cool. Leaders should ensure that their Soldiers are not overdressed for the job they are performing.

6-179. Loose—clothing is worn loose in layers. All items of the cold weather uniform are sized to allow wearing of the appropriate number of layers. This means, for example, that the field jacket may appear too

large when worn without all of the layers designed to fit under it. If the uniform items do not fit loosely, the insulation will be substantially reduced.

6-180. Dry—clothing is kept dry. It is vital that all layers of clothing be kept dry because wet clothing conducts heat away from the body, compromising the microclimate around the body and making it difficult to regulate body temperature. Moisture soaks into clothing from two directions: from melting snow and frost that has collected on the outside of the clothing and from perspiration. Leaders should ensure that Soldiers brush snow and frost from clothing before entering heated shelters or vehicles.

6-181. Repair and replace— damaged clothing should be repaired and non-repairable or nonfunctioning gear should be replaced. Soldiers should constantly inspect their clothing for serviceability and repair or replace items as necessary.

EXTREME COLD WEATHER CLOTHING

6-182. The Cold Temperature and Artic Protection System (also called CTAPS), for extreme cold weather environments, is a 5-layer system designed to keep the Soldier warm and comfortable in extreme cold weather environments while reducing weight and increasing movement. The Cold Temperature and Artic Protection System is a 5-layer system designed to be worn in any combination of layers depending on the mission requirements and need of the individual Soldier. The layered system allows the Soldier to adapt to many different cold weather environments. (See ATP 3-90.96 for additional information on extreme cold weather conditions). Characteristics of the layers include:

- The base layer is a full long sleeve top and bottom next-to-skin layer that provides moisture management to keep sweat and water off the Soldier's body.
- The lightweight insulated layer provides thermal insulation and has vented armpits for increased range of motion, moisture management and cooling during movement, designed to be worn on mild cool days underneath the outer shell layers.
- The softshell uniform is the primary outer garment to be worn in place of the Army Combat Uniform in cold environments.
- The cold-wet weather uniform is a breathable hard-shell top and bottom rain layer designed for prolonged rain and cold/wet conditions.
- The extreme cold weather parka/trousers is the outer most layer to provide maximum thermal insulation, and is designed for static missions, like standing guard in extreme cold weather.

WEAPONS AND MUNITIONS

6-183. The functioning and employment of Infantry weapons is greatly affected by extreme cold temperatures. To properly handle and care for your weapons under a variety of adverse conditions, Soldiers should take the temperature, altitude, and precipitation into account. Weapons should be worked every 30 minutes to keep them from freezing. This should include racking the bolt, dropping the magazine, and pushing the ammunition to ensure they are not frozen together. Soldiers should become accustomed to manipulating their weapons in cold weather conditions while wearing bulky hand wear. Variables affecting weapon performance in cold climates include—

- Lubricants:
  - Normal lubricants thicken causing stoppage or sluggish action.
  - Lubricating oil designed for artic weapons (lubricating oil—NSN 9150-00-292-9689) are used to lube weapons in colder temperatures (see individual weapons technical manual).
  - Commercial off-the-shelf metal conditioner lubricants are useful in extremely cold conditions where there is no liquid to congeal and slow down or freeze the action.
  - Personnel should use lubricant oil, semifluid, automatic weapons, temperate on MK19.
  - Powdered graphite is not good for automatic weapons.
- Condensation:
  - Occurs when cold weapons are brought into a heated area (called sweating) and can continue up to an hour.
  - Troop compartments should be kept cool (aircraft or vehicles).
  - Although it is worse from below to above freezing, sweating can still be caused by a large temperature change above freezing.
  - Body heat and breath can affect optics under certain conditions.

- Breakage and malfunctions:
  - Cold makes metal and plastic brittle.
  - Breakage generally occurs during rapid warming of metal.
  - Soldiers should initially fire at a slower rate (if possible).
  - Melting snow and ice on weapons may cause stoppages (linked ammunition, tops of magazines, barrel, and sights).
- Visibility (ice and fog):
  - Temperatures 20 degrees below 0.
  - High humidity.
  - Water vapor in air is crystallized forming fog.
  - Can mask LOS, wind can dissipate fire at slower rate or relocate.
- Emplacement:
  - Hard—no shock absorption can cause weapons breakage.
  - Soft—gives under recoil of weapon, weapons need to be adjusted.
  - Slippery—weapon may slide.
  - Improvised bases can be used (snowshoes, ski poles, and sled).

ASSAULT PACKS

6-184. First-class lightweight assault packs are vital. Leaders at all levels review and modify existing unit packing lists and SOPs when conducting dismounted operations in mountainous terrain. Leaders should ensure Soldiers do not overload the assault packs in excess of 40 pounds. In an extreme cold weather environment (and dependent on the situation), every effort is made to keep the Soldier with the personal approach march load or emergency approach march load. A sleeping bag, extra clothing, rations, and other equipment can mean the difference between life and death. An approach march load or an emergency approach march load (see paragraph 5-225 and 5-226, respectively) can be cached before an assault but avoid leaving them behind altogether. Sustainment loads (see paragraph 5-227) must be pushed forward as soon as practical.

ALTIMETERS

6-185. Some personnel within the unit should have an altimeter and one should accompany every patrol in mountain environments. Leaders should be aware of their altitude in the mountains for both medical and operational reasons. Medical personnel may be a viable option for carrying altimeters as they can periodically keep a check on the unit's altitude as they traverse the mountain terrain. Altimeters can also be useful during route planning and during land navigation.

WATER PURIFICATION DEVICES

6-186. Soldiers need plenty of fluids while conducting mountain operations. The amount of water needed for sustainment can be a heavy load to carry. Purification devices can render mountain water safe for consumption and may include purification tablets, electrochemical water disinfection pens, and water pump filters.

6-187. Handheld water treatment devices provide a means to aid in the production of potable water in short term and emergency use situations. The type of handheld device should be selected after applying the principles of RM, to include factors such as quality of the water to be treated, the duration of the mission, and the potential for existing and intentional contamination. Handheld water treatment devices are not a foolproof method of providing potable water and certain precautions should be taken in their selection and use. While these devices provide a certain level of treatment, the disinfection of the product water is often overlooked. A two-stage process of mechanical filtration with a handheld device, followed by chemical disinfection, is recommended for short-term and emergency use situations. In all cases, Army units should follow the manufacturer's instructions for care and maintenance of the handheld treatment devices.

INDIVIDUAL SURVIVAL ITEMS

6-188. Leaders also need to prepare Soldiers for unexpected extended periods of separation while conducting operations in the mountains. Enemy actions, weather conditions, or other circumstances may demand

Soldiers or units to survive for some period in the mountains without external support. All personnel should be prepared for these situations.

6-189. Although leaders determine what items will be carried by their Soldiers, the following list of common survival items is provided for consideration:

- Waterproof matches and fire starters (candles, magnesium match).
- Wire saw.
- Signaling devices (mirror, cold weather whistle).
- Pocketknife.
- Pressure bandage, lip balm, and sunglasses.
- Water container (metal for use in fire).
- Compass.
- Emergency rations.
- Foil survival blanket.
- 5 meters (16 feet) of strong nylon cord or survival snaring wire.
- Small flashlight or headlamp.
- Infrared strobe.
- Potable water.

RESUPPLY CONSIDERATIONS

6-190. Small-unit leaders and logistics planners consider the distance and difficulty of terrain movements during travel to and from a resupply point if travel by foot is required. Crossing mountain terrain is often physically demanding to the point that Soldiers could exhaust themselves just by picking up supplies. Resupply efforts alone could leave Soldiers less effective for their intended mission. Time and physical demands on the Soldiers often make dismounted retrieval from a distant drop off location a poor option. More often resupply to units in the mountains is conducted by some sort of air delivery. Because suitable and safe LZs for aircraft in the mountains are hard to find, a common resupply delivery is accomplished by helicopters flying at a low altitude above the mountain terrain using unit-configured load deliveries.

LOGISTICS ESTIMATES AND LOADS

6-191. Leaders and logisticians customize logistics estimates and loads for specific locations and unique conditions within mountainous terrain. Due to the increased complexity and difficulty in delivery to a final destination, logistical resupply items are generally pushed as far forward as possible when operating in mountain environments. Mountain terrain and weather slow and complicate all actions including resupply of ammunition and sustainment items. Supplies are often stored at a forward base in prepared packages of anticipated unit needs. When feasible, logistical planners build overages into supply estimates for items that wear out quickly, such as boots, jackets, and gloves.

MEANS OF TRANSPORTATION

6-192. A variety of transport means is often required for logistical support in mountain environments. Road transport is often the most reliable and cost-effective. However, main supply routes in this environment are generally limited and often do not support vehicles that have a large turning radius. Roads often do not permit two-way traffic. While tactical plans consider main roads, tactical engagements often occur away from these routes.

6-193. At higher altitudes where vehicles cannot be used due to climate and terrain conditions, pack animals may be used for transport of heavy logistical items. Sleds, carts, mules, and horses, in addition to vehicles, when possible, are common for mountain movement of supplies. When the conditions get too rough for even the animals, Soldiers must rely on themselves, local personnel, and air-delivered supplies for logistical support.

EXCESS SUPPLIES

6-194. The commander’s guidance or unit SOP should state the procedures for dealing with excess supplies during mountain operations. For supplies delivered by air to remote locations, pick-up or transportation of excess supplies is often impractical. Units that request specific types and amounts of supplies may be

delivered more than what they need or can effectively use due to push system projections or other factors. Supply personnel often prepackage supplies in loads most often needed by size unit or in loads that would accommodate different types of units if requested. Regardless of the reason for the excess, these supplies cannot be left unattended and available for enemy personnel to find and use. Excess supplies that cannot be guarded, used, or picked up by friendly force personnel are commonly burned or otherwise destroyed according to unit SOP or commander's guidance.

MOVEMENT OF SUPPLIES

6-195. Leaders, during small-unit operations, move supplies for mountain operations using one of four means. These include movement by foot, vehicle, air, or animal. Logistical movements from a distribution point down to the end user usually include a combination of movement means. For example, vehicles may transport supplies as far as possible into the mountains and then they are carried by foot or animal to their final destination. Porters, local personnel capable of carrying heavy loads, may be contracted to carry loads across difficult terrain. Using pack animals requires that loads be broken up according to their carrying capacity. Helicopters transport supplies to remote, hard-to-reach locations but can be constrained by altitude and harsh weather. Since air assets, in high demand, are limited in number and cannot be used in extreme adverse weather, a mixture of resources is necessary to ensure reliability and flexibility during resupply. (See ATP 3-21.18 for more information on the movement of supplies for dismounted movement.)

Foot

6-196. The preferred method of transportation of supplies is by any means other than on the backs of Soldiers. Even so, the mission variables of METT-TC (I) often dictate that Soldiers carry all the supplies needed for a particular mission. Soldiers often use litters to help move supplies and equipment while traveling on foot. A litter can help Soldiers move heavier items (such as mortar rounds) through difficult areas and rough terrain. Ropes and pulleys in conjunction with litters are used to haul supplies up or down steep slopes. When contracted, local personnel can assist in carrying supplies by foot. When available, these personnel can carry excess supplies up to a particular point and then released. Supplies can also be stored in a cache for later use. (See ATP 3-21.18 for additional information.)

Vehicles and Carts

6-197. An analysis of mission needs versus transport time, cost, and asset availability, often makes movement by vehicle the preferred method for resupply. Vehicles may include military vehicles as well as nonstandard tactical vehicles, trucks, cars, four-wheel drive, motorcycles, or other motorized means of transportation. Contract host-nation vehicles may also be used for ground transportation movement of supplies in the mountains. (See ATP 3-21.10 and ATP 3-21.8 for additional information.)

Load Carriage Using Motor Vehicles

6-198. Removing much of the load burden from Soldiers requires using a wide variety of motor vehicles. Systems that have carried Soldier equipment in rugged areas in Afghanistan have included a two-seat, six-wheeled squad vehicle that carries loads up to 550 kilograms (1,213 pounds) and runs on aviation turbine fuel. Units also used a four-wheel, all-terrain vehicle that carries one Soldier and loads up to 204 kilograms (450 pounds). There still may be terrain unsuitable for motor vehicles or carts of any type, where Soldiers must personally bear the load.

Resupply Convoys

6-199. Resupply vehicle convoys are often the target of enemy ambushes. Unprotected convoys can fall into the hands of the enemy depriving friendly forces of the items, straining the logistical system and assisting the enemy with compromised ammunition or supplies.

Vehicle Recovery

6-200. Harsh road conditions, harsh weather, and high altitudes have adverse effects on vehicles. Rough mountain roads can cause frequent vehicle breakdowns. High altitudes can reduce fuel efficiency and affect engine operation. Mechanics, if available, should accompany every mounted movement into the mountains.

If not available, personnel who work on a broken-down vehicle should be identified and carry the necessary tools. Recovery resources including tow straps, tow bars, winches, sandbags, and shovels should be part of every mounted movement and part of the PCI.

6-201. Vehicle recovery in mountain terrain can be extremely difficult. Steep terrain, narrow roads, and weather conditions can create conditions to where recovery is extremely complicated, time-consuming, or impossible. When vehicles become disabled in mountain terrain, recovery alternatives include attempting to fix the vehicle with a contact team, towing it to a vehicle collection point, extracting it by heavy lift aviation assets, or destroying it in place. Recovery and on-site repair by forward contact teams is preferred if possible.

6-202. Units should also be capable of employing self-recovery techniques for instances where wreckers are not available or are prevented from deploying to the disabled vehicle site. Lightweight tow bars are useful but need to be used properly or they may become a liability. A minimum of two tow bars should be carried with every movement using vehicles. Vehicles with winches are also essential. Caution is used when using chains and cables as they can easily break loose and allow the disabled vehicle to slide. Leaders rehearse vehicle recovery plans and each Soldier should know their part in vehicle recovery operations. Leaders share vehicle recovery techniques found to be useful between vehicles and units. Units plan for the moving of disabled vehicles to clear a road or path.

Load Carriage Using Wheeled Carts

6-203. Load carriage using wheeled carts is often an option to the commander to transport loads in certain situations. Generally durable, they can carry or exceed their rated loads (91 kilograms or 201 pounds to 181 kilograms or 399 pounds), and can be used effectively on flat terrain, in barrier construction, and in resupply. On the negative side, carts create problems on rugged terrain. They are noisy in brush or rocky areas, thus reducing tactical surprise, and equipment can be caught in the wheels of some carts.

6-204. Combat load carts appropriate for military operations should have low center of gravity, wide wheelbase, and large wheel size. Compared with body carriage, energy expenditure is reduced by 88 percent when a 50-kilogram (110-pounds) load is pushed in a cart on smooth surfaces. Pulled carts, rather than pushed, seem to be easier to control on uneven terrain and result in considerable energy expenditure-savings.

Air

6-205. Movement of supplies by air is often the preferred method for remote, hard-to-reach locations when assets are available and the weather, terrain, and situation allow. Direct communication between the unit and the air delivery asset is coordinated early in the planning process to help ensure proper delivery. Supplies dropped to an area near the actual designated location can mean the difference between an easy-, difficult-, or non-recovery of the supplies.

6-206. An airdrop of supplies in mountain terrain can easily turn into a difficult resupply mission if not well coordinated, especially during periods of limited visibility. Delivered packages can easily slide down a mountainside, slip off into a deep ravine, or disappear into deep snow if not placed properly. It is often difficult for pilots to identify and place packages at a precise location in the mountains if they are not in direct communication with the receiving unit. Units' SOPs determine the configuration of supplies and the delivery method used by the aircraft. (See ATP 3-21.20 for additional information.)

Unit-Configured Loads

6-207. Unit-configured loads (commonly referred to as "speedballs") are preconfigured resupply loads which may be delivered by helicopters. Supplies are often prepackaged in aviation kit bags, duffle bags, or other suitable containers by sustainment personnel for a quick response. Body bags, or human remains bags, may be used to move supplies. These bags should be clearly marked with the word SUPPLIES stenciled in a bright color on the bag to avoid confusion. These bags are readily available through supply channels and have proven to be extremely useful because they are durable, waterproof, have carrying handles, can hold many items, and can be folded and carried in a rucksack.

6-208. Helicopters pick up unit-configured loads, fly as close to a drop off point as possible, reduce speed, drop supplies, and leave the area quickly to reduce exposure time. Supplies should be prepackaged in bubble

wrap or other shock-absorbing material to minimize damage. This technique works well in the mountains, especially where there is a minimal or no air defense threat. Drop off locations should be marked if possible, keeping in mind the risk of exposing the receiving unit's location. VS-17 panels are commonly used for these purposes. In mountain conflicts, unit-configured loads have become the delivery method of choice for delivery of supplies to remote unit locations hampered by distance and terrain. Unit locations such as a combat outpost on a mountain hilltop or ridge use these deliveries on a routine basis.

Sling-Load and Rope

6-209. Sling-load and rope deliveries are like unit-configured loads except the supplies are lowered by rope or slung under the aircraft. Supplies and properly rigged equipment can be attached to a rope using a snap link and slid down. Once the supplies are received, the same rope can be used to back haul cans, containers, or other items. Care should be taken to ensure that a counterweight remains at the end of the rope so that it does not flap into the wind and catch the helicopter rotors. Care should be taken with heavy items so they do not slide down the rope and damage other supplies. Multiple water cans and "speedballs" can be linked together by means of a sling rope with a snap link attached. To slow the rate of descent, a round turn can be applied to the snap link holding the supplies. The rope can also be belayed from the ground to help control the rate of descent. In sling-load operations, the packaged supplies are suspended under the aircraft and set on the ground from a hover. Conducting these types of resupplies requires training and coordination prior to execution. Aircrews and ground support personnel must understand the procedures that will be used. Sling-load coordination requires certification of loads and air assault trained individuals to conduct hook up and drop operations to avoid damaging the load or aircraft or injuring a member of the aircrew or support personnel.

Low-Cost, Low-Altitude Delivery

6-210. Some supplies may be delivered by means of low-cost, low-altitude parachute deliveries. Often, but not necessarily, these types of supplies are limited to food such as meals ready to eat and water. There are a number of systems that may be employed for low-cost, low-altitude deliveries, some being more accurate than others. Inaccurate deliveries on the side of a mountain can create a situation that requires extensive time and manpower for recovery of the supplies. If the mission variables of METT-TC (I) allow, sling-load or unit-configured load deliveries are often preferred. Low-cost, low altitude is performed by certified and trained aircrews and is coordinated prior to execution to ensure minimal damage or loss.

Joint Precision Airdrop System

6-211. If available, modern high-tech systems such as the Joint Precision Airdrop System may be used. The Joint Precision Airdrop System is a joint Army and Air Force aerial-delivered package system dropped with a ram-air parachute and guided by a Global Positioning System. The Global Positioning System and steerable parachute work with the onboard computer to steer loads to a designated point on a drop zone. These systems can deliver supplies from over 15,000 feet and have them land inside a 100-foot circle of a designated location. These precision airdrops enable units in austere locations to receive supplies while keeping the aircraft safe at a high altitude. In the mountains, where air delivery is used extensively to resupply forces in remote locations, large drop zones may be severely restricted by terrain and weather conditions. Use of the Joint Precision Airdrop System does not require a large drop zone and could effectively save time and energy in retrieval of air delivered supplies.

Pack Animal

6-212. The use of pack animals (donkeys, mules, horses, and other animals) to aid in the movement of supplies and equipment is a standard practice in many mountain environments. Local personnel understand these animals' abilities, limitations, and most of all, how to load and control them. They also are skilled at providing the proper motivation to make the animals perform the required tasks. For planning purposes, the total load animals can carry normally does not exceed 25-percent of its weight. With practice, heavy weapons such as the M2 (heavy machine gun) and tube-launched, optically tracked, wire-guided/wireless guided missile systems can be moved by pack animals.

6-213. For example, a mule can carry up to 200 pounds of cargo and traverse slopes up to 60 degrees. Panniers (baskets used on pack animals) can be rigged to carry just about anything, including weapons and ammo. Carts may also be used. A team of mules require very little maintenance and, if natural grazing material is available, mules need only graze 4 hours a day. If unavailable or inaccessible, mules can pack in their own grain and water.

6-214. In planning for the use of pack animals, leaders should consider the following questions:

- Is the terrain conducive to pack animal operations?
- Does altitude prohibit or restrict pack animal operations?
- Does seasonal bad weather prohibit or restrict pack animal use?
- Does the unit have experience navigating pack animals in limited visibility conditions?
- Does the unit have the training and experience to execute pack animal operations successfully?
- Are pack animals available for training and rehearsals?
- What types of pack animals are available in the operational area?
- What special equipment is required to conduct pack animal operations?
- What is the anticipated duration of the operation?
- Are there areas for the animal to graze or forage?
- Does the unit have the means to infiltrate the required equipment into the AO?
- Does the equipment require special rigging?
- Does it have special handling and storage requirements?
- Is the unit going to use the local pack equipment?
- Does the unit know about local pack equipment?
- Does the unit need to hire a local handler to pack the animals?
- Will the handler travel far from home?
- Is time available for the unit to plan and rehearse pack animal use before mission execution?
- Will time be available on the ground for the unit to rehearse packing the animals?
- Will there be time to acquire local equipment and feed, and to inspect animals if needed?
- Will unit have access to veterinary services?

6-215. Although these animals can carry heavier loads for longer periods of time than Soldiers can, they do tire. They should be cared for, fed, and watered. Their carrying capacity also decreases with higher elevations. Table 6-2 lists advantages and disadvantages of using pack animals. (See ATP 3-18.13 for additional information.)

Table 6-2. Pack animal considerations

Pack Animal Advantages	*Pack Animal Disadvantages*
May save energy and wear on troops	Have terrain limitations, especially on narrow trails where wide loads limit their mobility
May save time	May have difficulty seeing during night movement with poor illumination
Can carry larger loads than troops	Must have proper feed (grain and roughage) to sustain performance
May stimulate the local economy in a counterinsurgency situation with payment for animals	May be difficult to secure and specifically targeted by the enemy
Are readily available and replaceable if lost due to injury or combat action	May be difficult to control and usually require a local handler
Can carry crew-served and heavy weapons when properly secured and controlled	Must have frequent water for sustained operations

Caches

6-216. Caches may be used as a means of resupply to small units operating in mountain environments. There are two major concerns when considering the use of caches in the mountains. Of primary concern is the means to initially get the supplies to the point where they will be stored for some period. Transportation of supplies to the site and its subsequent security are main considerations.

6-217. Caches are often used for dismounted patrols out for extended periods. These patrols often operate in areas where vehicular traffic is not possible. Supplies must be brought in by foot, animal, or air. Care should be taken to store caches carefully without disclosing their location. Even a properly concealed cache may be discovered by enemy personnel, aiding them and hindering the unit's mission.

SECTION VII – SPECIAL PURPOSE TEAMS, SKILLS, AND ATTACHMENTS

6-218. During mountain and cold weather operations, as in all operations, small-unit commanders and subordinate leaders consider how to employ enablers to support combat operations. Enablers include, in addition to special purpose teams established internally, individuals with specific environmental skills and capabilities, and attachments such as manned or unmanned aviation, civil affairs teams, military working dogs (MWDs), public affairs teams, HUMINT collection teams, and interpreters. Commanders and subordinate leaders leverage these enablers by effectively task organizing them within the formation. They consider direct fire control measures (see paragraph 6-21) and indirect fire coordination measures (see paragraph 6-40), and how they will affect supporting enablers, such as aviation support. All attachments, if possible, attend rehearsals to ensure they understand the commander's intent and their individual task(s) and purpose in the operation.

Note. MWDs are less effective in mountainous regions. Mountains, gorges, buttes, breaks, valleys, and timberlines will all cause the wind to sweep and swirl, thus diminishing the detection capability of the MWD. Further, cold weather temperatures also diminish the presence of the scent. See ATP 3-39.34 for more information on the limited capability of MWDs in mountainous and cold weather environments.

SPECIAL PURPOSE TEAMS

6-219. Commanders and subordinate leaders identify special purpose teams from within the unit to perform specific tasks when required. Select platoons, squads, or fire teams are often identified as being responsible for these tasks and may be responsible for multiple tasks. Subordinate leaders attempt to maintain platoon, squad, and fire team integrity to the maximum extent possible when identifying special purpose teams. Leaders may designate as many or as few teams as they deem necessary. Common special teams are often identified in unit tactical SOPs but may be augmented with other teams depending on the environment and specific operation being conducted. Commanders will organize their units for combat with consideration of teams needed for a specific mission.

6-220. Common teams (see ATP 3-21.10 and ATP 3-21.8 for a detailed discussion of each team listed) include—

- Aid and litter teams.
- Enemy prisoner of war or detainee teams.
- Surveillance teams.
- Assault teams.
- Support teams.
- Breach teams.
- Demolition teams.
- Site exploitation teams.

6-221. Operations in mountain environments often create unique circumstances where designation of other special teams is common. Commanders may consider identifying additional teams to include teams such as—

- Rope installation teams.
- Cave and tunnel exploitation teams.
- Route reconnaissance teams.
- LZ teams.

SPECIALIST SKILLS AND TRAINING

6-222. During planning, preparation, and organizing the company for combat, and designating special purpose teams, the commander should consider the specific skill capabilities of individual Soldiers. Certain teams designated by the commander require that some Soldiers be knowledgeable on specific skills to perform unique functions. Operations in mountain terrain often require the use of these skills and the formation of teams from Soldiers that possess those abilities. (See ATP 3-90.97 for more information on special skills and training for mountain and cold weather operations.) Paragraphs 6-223 through 6-225 list three common levels of military mountaineering and their supporting skill sets.

LEVEL 1: BASIC MOUNTAINEER

6-223. The basic mountaineer, a graduate of the basic mountaineering course, should be trained in the fundamental travel and climbing skills necessary to move safely and efficiently in mountainous terrain. Soldiers should be comfortable functioning in this environment and, under the supervision of qualified mountain leaders or assault climbers, can assist in the rigging and use of all basic rope installations. On technically difficult terrain, the basic mountaineer should be capable of performing duties as the follower or second on a roped climbing team and should be well-trained in using all basic rope systems. They may provide limited assistance to personnel unskilled in mountaineering techniques. Particularly adept Soldiers may be selected as members of special purpose teams led and supervised by mountain leaders or advanced mountaineers. At a minimum, basic mountaineers should possess the mountain-specific knowledge and skills listed below:

- Characteristics of the mountain environment (summer and winter).
- Mountaineering safety.
- Use, care, and packing of individual cold weather clothing and equipment.
- Care and use of basic mountaineering equipment.
- Mountain bivouac techniques.
- Mountain communications.
- Mountain travel and walking techniques.
- Hazard recognition and route selection.
- Mountain navigation.
- Basic MEDEVAC.
- Rope management and knots.
- Natural anchors.
- Familiarization with artificial anchors.
- Belay and rappel techniques.
- Use of fixed ropes (lines).
- Rock climbing fundamentals.
- Rope bridges and lowering systems.
- Individual movement on snow and ice.
- Mountain stream crossings (to include water survival techniques).
- First aid for mountain illnesses and injuries.

Note. Level 1 qualified personnel should be identified and prepared to serve as assistant instructors to train unqualified personnel in basic mountaineering skills. All high-risk training must be conducted under the supervision of qualified level 2 or 3 personnel.

LEVEL 2: ADVANCED MOUNTAINEER (ASSAULT CLIMBER)

6-224. Advanced mountaineers, or assault climbers, are responsible for the rigging, inspection, use, and operation of all basic rope systems. They are trained in additional rope management skills, knot tying, belay and rappel techniques, as well as using specialized mountaineering equipment. Advanced mountaineers are capable of rigging complex, multipoint anchors and high-angle raising/lowering systems. Level 2 qualification is required to supervise all high-risk training associated with level 1. At a minimum, advanced mountaineers should possess the additional knowledge and skills listed below:

- Using specialized mountaineering equipment.
- Performing multipitch climbing on rock, leading on classes 4 and 5 terrain.
- Conducting multipitch rappelling.
- Establishing and operating hauling systems.
- Establishing fixed ropes with or without intermediate anchors.
- Familiarization with movement on moderate angle snow and ice.
- Establishing evacuation systems and perform high-angle rescue.

LEVEL 3: MOUNTAIN LEADER

6-225. Mountain leaders possess all the skills of the advanced mountaineer and have extensive practical experience in a variety of mountain environments in both winter and summer conditions. Level 3 mountaineers should have well-developed hazard evaluation and safe route-finding skills over all types of mountainous terrain. Mountain leaders are best qualified to advise commanders on all aspects of mountain operations, particularly the preparation and leadership required to move units over technically difficult, hazardous, or exposed terrain. The mountain leader is the highest level of qualification and is the principal trainer for conducting mountain operations. Level 2 qualification is required to supervise all high-risk training associated with level 2. Instructor experience at a military mountain warfare-training center or as a member of a special operations force's mountain team is critical to acquiring level 3 qualification. At a minimum, mountain leaders should possess the additional knowledge and skills listed below:

- Advising commanders and staff during planning on mountain warfare considerations across all warfighting functions.
- Preparing route, movement, bivouac, and RM.
- Recognizing and evaluating peculiar terrain, weather, and hazards.
- Performing avalanche hazard evaluation and mitigation.
- Organizing and leading avalanche rescue operations.
- Planning and supervising roped movement techniques on steep snow and ice.
- Conducting glacier travel and crevasse rescue.
- Conducting ski instruction.
- Planning and conducting cross-country ski borne patrols in rolling terrain up to 15 degrees.
- Knowing winter shelters and survival techniques.
- Conducting multipitch climbing on mixed terrain (rock, snow, and ice).
- Leading units over technically difficult, hazardous, or exposed terrain in both winter and summer conditions.

Note. ATP 3-90.97, tables 10-2 through 10-5, provide an abstract of available instruction by individual, collective, and aviation summer and cold weather training certified and instructed by U.S. personnel.

ATTACHMENTS

6-226. As additional information becomes available during initial planning and reconnaissance, it may become evident to the commander that additional enablers are required to execute the mission. Because some resources, such as manned or unmanned aviation, civil affairs teams, public affairs teams, HUMINT collection teams, and interpreters, may require a request process and significant lead-time, it is important that the commander identifies critical enablers early in the planning process to incorporate into the company formation to maximize efficiency. Specific enablers that may require linkup procedures such as explosive ordnance disposal or a quick reaction force may require coordination before beginning the operation. The members of these teams are subject matter experts, and the commander should consult them directly regarding their methods of employment, strengths and weaknesses, and requirements (some MWDs require climate control for best employment). Paragraphs 6-227 through 6-243 address common enablers, although not inclusive, available during the conduct of Infantry small-unit mountain operations.

MILITARY WORKING DOGS

6-227. MWD teams consist of one dog and one handler trained and certified as an entity. An Army MWD handler will normally be military police, a combat engineer, or special operations Soldier, qualified in their primary military occupational specialty. The supported tactical commander or subordinate leader, through consultation with the kennel master, selects the single purpose or multi-purpose canine that best supports the mission. MWD capabilities include dogs specialized in one or more areas (see ATP 3-39.34, chapter 1 for more details).

MILITARY WORKING DOGS CAPABILITIES

6-228. Patrol dogs provide a psychological deterrent, are a force multiplier, and are a show of additional force. This dog works primarily on-leash. In either case, the patrol dog works close to its handler. All MWDs with "patrol" in their name are trained to bite and hold, by command. They are trained to detect people (limited), narcotics, or explosives.

6-229. Patrol drug dog teams are trained for police patrol activities, drug detection, and limited tactical search missions. The patrol narcotic detector dogs or patrol drug detection dogs give a response to trained odors and work on-leash.

6-230. Patrol explosive-detection dog teams are dual-trained for police patrol activities and explosive detection. The patrol explosive detector dogs detect explosives based on response to the presence of trained odors and works on- or off-leash.

6-231. Mine detection dogs are trained to perform military mine-detection missions in a hostile environment. Their handlers are exclusively engineer Soldiers, and the mine detection dog works on short lead or long line. (See ATP 3-39.34 for additional information on MWD patrol and detection capabilities.)

AIR DELIVERY SYSTEMS

6-232. Air delivery systems are extensively used for resupply in mountain terrain. Deliveries to larger units may be conducted using containerized delivery systems dropped from higher altitudes using parachutes for lowering the supplies. For small-unit operations, air delivered supplies are packaged in smaller bundles and delivered through a variety of methods. Delivery platforms may be U.S. aircraft or the aircraft of other nations. Contract aircraft from host-nation or other sources are also used for delivery of supplies. Leaders need to keep in mind that direct communication with host-nation aircraft may be difficult or impossible and delivery procedures may not always be what the receiving unit is expecting.

INTERPRETERS

6-233. Interpreters are extensively employed and extremely beneficial while operating in mountain environments in foreign areas. Interpreters are often foreign personnel that also speak English as opposed to English-speaking personnel that have learned the foreign language. This can present a number of issues. Leaders need to consider that when an interpreter is assigned to a unit, the foreign dialect may not be appropriate for the area in which they are operating. The interpreters' conduct should be monitored for inappropriate behavior while interacting among the local population. Interpreters can be corrupt and use their position for monetary gain for themselves. Their actions may put the unit at risk as opposed to assisting them.

6-234. It is important that the interpreter understands they are there only to interpret and nothing else. Some interpreters may attempt to inappropriately add or take away some things said in order not to offend local personnel. It needs to be clear that their job is to translate precisely what is said. The level of English spoken by interpreters varies and the lack of a complete understanding of the English language can also create a problem. As with personnel in most organizations, some interpreters will be better than others.

6-235. Interpreters are usually at the ranking leader's disposal. They are there to assist and should be treated with the same respect as unit Soldiers. Leaders will often have some things to teach to their interpreter as well as things that they can learn from the interpreter about their culture. Using interpreters requires a two-way relationship with care and respect. It is important that all unit personnel remember that the interpreter can understand any comment or remark made by Soldiers. Any off-handed remark or small-minded insult could not only undermine the relationship with the unit, but also potentially impact their combat mission (see ATP 3-55.4, appendix B for more details).

HOST-NATION FORCE AUGMENTATION

6-236. Host-nation forces have the advantage of being in their homeland where they know more about the country, the situation, the terrain, and the culture than U.S. Forces. They are a valuable resource for understanding the terrain in a particular area and can help save time and energy while planning and conducting operations. Host-nation forces often have robust HUMINT capabilities since they know the terrain, local populace, and customs much better than U.S. Forces and can often spot something that does not look right easier than U.S. personnel. Leaders should understand host-nation force capabilities and limitations and use them accordingly. (See ATP 3-21.10 and ATP 3-21.20 for information on host-nation force augmentation and security force assistance missions.)

6-237. Leaders should consider combined force operations from the augmenting force leader's perspective to better operate alongside them.

COMBINED FORCE OPERATIONS KEY CONSIDERATIONS

6-238. Establish effective relationships with host-nation forces based on personal rapport built by key leaders and include host-nation leaders in the planning stage of operations. They need to feel like a part of the operation rather than a pawn in another commander's scheme. If these personnel are left out of planning, they may be less willing to perform up to their full potential. Also, include host-nation forces in rehearsals, PCIs, and PCCs.

6-239. Attaching U.S. advisors to host-nation force leaders and embedded trainers, if available, ensures the augmenting force understands and is prepared for missions. Leaders should consider that host-nation units and personnel may not have the same standards or discipline as U.S. Forces and may not perform in the same manner as expected of a U.S. Soldier. Employ host-nation forces within their capabilities as they often do not have the same capabilities as U.S. Soldiers and units.

6-240. Host-nation forces are often collocated with U.S. Forces in an established position such as an operating base. These forces should be integrated into the overall defensive plan for the base and may be given a portion of the perimeter to defend with their fires integrated with the U.S. unit. Leaders from both forces need to understand the importance of integrating the units for a combined defense. Contingency plans should be established for failure of the host-nation portion of the defensive perimeter. (See ATP 3-21.10 for information on insider threats.)

6-241. U.S. Forces may need to provide logistical support to host-nation forces.

6-242. Intermingle host-nation forces with their own unit while conducting missions such as combat patrols. Host-nation personnel will often look to the U.S. Soldier for actions and guidance during conflicts.

6-243. Use host-nation forces to help in searching operations while on patrols because U.S. Forces may be restricted on entering dwellings while host-nation forces can often enter houses with fewer limitations and search restricted areas.

This page intentionally left blank.

Glossary

The glossary lists acronyms and terms with Army or joint definitions. Where Army and joint definitions differ, (Army) precedes the definition. ATP 3-21.50 is not the proponent publication (the authority) for any operational term or definition. The proponent publication for other terms is listed in parentheses after the definition.

SECTION I – ACRONYMS AND ABBREVIATIONS

1SG	first sergeant
ADP	Army doctrine publication
AFTTP	Air Force tactics, techniques, and procedures
AMS	acute mountain sickness
AO	area of operations
ATP	Army techniques publication
C2	command and control
CAS	close air support
CASEVAC	casualty evacuation
CBRN	chemical, biological, radiological, or nuclear
CCMS	close combat missile system
COA	course of action
CP	command post
DA	Department of the Army
DD	Department of Defense form
DOD	Department of Defense
EA	engagement area
EP	electromagnetic protection
EW	electromagnetic warfare
FM	field manual
HUMINT	human intelligence
IBCT	Infantry brigade combat team
IPOE	intelligence preparation of the operational environment
IST	intelligence support team
JP	joint publication
LOS	line of sight
LZ	landing zone
MAAWS	Multi-role, Antiarmor, Antipersonnel Weapon System
MCOO	modified combined obstacle overlay
MCRP	Marine Corps reference publication
MCTP	Marine Corps tactical publication
MED	medical

MEDEVAC	medical evacuation
METT-TC (I)	mission, enemy, terrain and weather, troops and support available, time available, civil considerations and informational considerations
mm	millimeter
MTC	movement to contact
MWD	military working dog
NCO	noncommissioned officer
NSN	national stock number
OP	observation post
PACE	primary, alternate, contingency, and emergency
PCC	precombat check
PCI	precombat inspection
PMCS	preventive maintenance checks and services
PPEP	personal protective equipment posture
R&S	reconnaissance and surveillance
RDSP	rapid decision making and synchronization process
RETRANS	retransmission
RM	risk management
ROE	rules of engagement
SLM	shoulder launched munition
SOP	standard operating procedure
TB	technical bulletin
TC	training circular
TCCC	tactical combat casualty care
TLP	troop leading procedures
TTP	tactics, techniques, and procedures
U.S.	United States
UAS	unmanned aircraft system
VHF	very high frequency
WCS	weapons control status
WP	white phosphorous
XO	executive officer

SECTION II – TERMS

actions on contact

A process to help leaders understand what is happening and to take action. (FM 3-90)

alternate position

A defensive position that the commander assigns to a unit or weapon system for occupation when the primary position becomes untenable or unsuitable for carrying out the assigned task. (FM 3-90)

ambush

A variation of attack from concealed positions against a moving or temporarily halted enemy. (FM 3-90)

area defense

A type of defensive operation that concentrates on denying enemy forces access to designated terrain for a specific time rather than destroying the enemy outright. (ADP 3-90)

area security

A type of security operation conducted to protect friendly forces, lines of communications, installation routes and actions within a specific area. (FM 3-90)

attack

A type of offensive operation that defeats enemy forces, seizes terrain, or secures terrain. (FM 3-90)

base camp

An evolving military facility that supports the military operations of a deployed unit and provides the necessary support and services for sustained operations. (ATP 3-37.10)

base cluster

(DOD) A collection of bases, geographically grouped for mutual protection and ease of command and control. (JP 3-10)

battle position

A defensive location oriented on a likely enemy avenue of approach. (ADP 3-90)

breakout

An operation conducted by an encircled force to regain freedom of movement or contact with friendly units. (ADP 3-90)

casualty evacuation

(Army) The movement of casualties aboard nonmedical vehicles or aircraft without en route medical care. (ATP 4-02.13)

close combat

Warfare carried out on land in a direct-fire fight, supported by direct and indirect fires and other assets. (ADP 3-0)

combat outpost

A reinforced observation post capable of conducting limited combat operations. (FM 3-90)

command

(DOD) The authority that a commander in the armed forces lawfully exercises over subordinates by virtue of rank or assignment. (JP 1, Vol 2)

command and control

(DOD) The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. (JP 1, Vol 2)

complex terrain

A geographical area consisting of one or more of the following: an urban center larger than a village, or two or more types of restrictive terrain or environmental conditions occupying the same geographic location. (ATP 3-34.80)

consolidate

To organize and strengthen a captured position to use it against the enemy. (FM 3-90)

control

The regulation of forces and warfighting functions to accomplish the mission in accordance with the commander’s intent. (ADP 6-0)

control measure

A means of regulating forces or warfighting functions. (ADP 6-0)

conventional warfare

A violent struggle for domination between nation-states or coalitions of nation-states. (ADP 3-0)

cordon and search

A variation of movement to contact where a friendly force isolates and searches a target area. (FM 3-90)

cordon security

The security provided between two combat outposts positioned to provide mutual support. (ATP 3-91)

countermobility

(Army/Marine Corps) A set of combined arms activities that use or enhance the effects of natural and man-made obstacles to prevent the enemy freedom of movement and maneuver. (ATP 3-90.8)

counterreconnaissance

A tactical mission task that encompasses all measures taken by a unit to counter enemy reconnaissance and surveillance efforts. (FM 3-90)

cyberspace operations

(DOD) The employment of cyberspace capabilities where the primary purpose is to achieve objectives in or through cyberspace. (JP 3-0)

defensive operation

An operation to defeat an enemy attack, gain time, and develop conditions favorable for offensive or stability operations. (ADP 3-0)

denial operations

Actions to hinder or deny the enemy the use of terrain, supplies, or facilities. (FM 3-90)

dismounted movement

A movement of troops and equipment mainly by foot, with limited support by vehicles. (FM 3-90)

electromagnetic warfare

(DOD) Military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. (JP 3-85)

engagement area

An area where the commander masses effects to contain and destroy an enemy force. (FM 3-90)

exfiltrate

A tactical mission task in which a unit removes Soldiers or units from areas under enemy control by stealth, deception, surprise, or clandestine means. (FM 3-90)

exfiltration

(DOD) The removal of personnel or units from areas under enemy control by stealth, deception, surprise, or clandestine means. (JP 3-50)

fire and movement

The concept of applying fires from all sources to suppress, neutralize, or destroy the enemy, and the tactical movement of combat forces in relation to the enemy (as components of maneuver applicable at all echelons). At the squad level, fire and movement entails a team placing suppressive fire on the enemy as another team moves against or around the enemy. (FM 3-96)

graphic control measure

A symbol used on maps and displays to regulate forces and warfighting functions. (ADP 6-0)

information collection

An activity that synchronizes and integrates the planning and employment of sensors and assets as well as the processing, exploitation, and dissemination systems in direct support of current and future operations. (FM 3-55)

intelligence operations

(Army) The tasks undertaken by military intelligence units through the intelligence disciplines to obtain information to satisfy validated requirements. (ADP 2-0)

irregular warfare

(Army) The overt, clandestine, and covert employment of military and nonmilitary capabilities by state and non-state actors to achieve policy objectives other than military domination of an enemy, either as the primary approach or in concert with conventional warfare. (ADP 3-0)

key terrain

(Army) An identifiable characteristic whose seizure or retention affords a marked advantage to either combatant. (ADP 3-90)

leadership

The activity of influencing people by providing purpose, direction, and motivation to accomplish the mission and improve the organization. (ADP 6-22)

level I threat

A small enemy force that can be defeated by those units normally operating in the echelon support area or by the perimeter defenses established by friendly bases and base clusters. (ATP 3-91)

level II threat

An enemy force or activities that can be defeated by a base or base cluster's defensive capabilities when augmented by a response force. (ATP 3-91)

level III threat

An enemy force or activities beyond the defensive capability of both the base and base cluster and any local reserve or response force. (ATP 3-91)

linkup

A type of enabling operation that involves the meeting of friendly ground forces, which occurs in a variety of circumstances. (FM 3-90)

local security

The low-level security activities conducted near a unit to prevent surprise by the enemy. (ADP 3-90)

main battle area

The area where the commander intends to deploy the bulk of their unit to defeat an attacking enemy. (FM 3-90)

maneuver

(Army) Movement in conjunction with fires. (ADP 3-90)

medical evacuation

The timely and effective movement of the wounded, injured, or ill to and between medical treatment facilities on dedicated and properly marked medical platforms with en route care provided by medical personnel. (ATP 4-02.2)

mission command

(Army) The Army's approach to command and control that empowers subordinate decision making and decentralized execution appropriate to the situation. (ADP 6-0)

mission variables

Categories of specific information needed to conduct operations. (ADP 1-01)

movement

The positioning of combat power to establish the conditions for maneuver. (ADP 3-90)

movement to contact

(Army) A type of offensive operation designed to establish or regain contact to develop the situation. (FM 3-90)

observation post

A position from which observations are made or fires are directed and adjusted. (FM 3-90)

offensive operation

An operation to defeat or destroy enemy forces and gain control of terrain, resources, and population centers. (ADP 3-0)

operational variables

A comprehensive set of information categories used to define an operational environment. (ADP 1-01)

primary position

The position that covers the enemy's most likely avenue of approach into the assigned area. (FM 3-90)

raid

(Army) A variation of attack to temporarily seize an objective with a planned withdrawal. (FM 3-90)

reorganization

All measures taken by the commander to maintain unit combat effectiveness or return it to a specified level of combat capability. (ATP 3-94.4)

risk management

(DOD) The process to identify, assess, and mitigate risks and make decisions that balance risk cost with mission benefits. (JP 3-0)

scheme of fires

The detailed, logical sequence of targets and fire support events to find and engage targets to support the commander's objectives. (JP 3-09)

search and attack

A variation of a movement to contact where a friendly force conducts coordinated attacks to defeat a distributed enemy force. (FM 3-90)

stay-behind operation

An operation in which a unit remains in position to conduct a specified mission while the remainder of the force withdraws or retires from an area. (FM 3-90)

strong point

A heavily fortified battle position tied to a natural or reinforcing obstacle to create an anchor for the defense or to deny the enemy decisive or key terrain. (ADP 3-90)

subsequent position

A position that a unit expects to move to during the course of battle. (FM 3-90)

supplementary position

A defensive position located within a unit's assigned area that provides the best sectors of fire and defensive terrain along an avenue of approach that is not the primary avenue where the enemy is expected to attack. (FM 3-90)

tactical combat force

(DOD) A rapidly deployable, air-ground, mobile combat unit with appropriate combat support and combat service support assets assigned to, and capable of, defeating Level III threats, including combined arms. (JP 3-10)

tactical movement

A movement in which troops and vehicles are arranged to protect combat forces during movement when a threat of enemy interference is possible. (FM 3-90)

tactics

(Army) The employment, ordered arrangement, and directed actions of forces in relation to each other. (ADP 3-90)

tempo

The relative speed and rhythm of military operations over time with respect to the enemy. (ADP 3-0)

References

All websites accessed on 10 July 2025.

REQUIRED PUBLICATIONS

These documents must be available to intended users of this publication.

DOD Dictionary of Military and Associated Terms. 15 May 2025.

FM 1-02.1. *Operational Terms*. 28 February 2024.

FM 1-02.2. *Military Symbols*. 23 January 2025.

RELATED PUBLICATIONS

These documents are cited in this publication.

JOINT PUBLICATIONS

Most joint publications are available online: https://www.jcs.mil/Doctrine

JP 1, Vol 2. *The Joint Force*. 19 June 2020.

JP 3-0. *Joint Campaigns and Operations*. 18 June 2022.

JP 3-09. *Joint Fire Support*. 10 April 2019.

JP 3-09.3. *Joint Close Air Support*. 10 June 2019.

JP 3-10. *Joint Security Operations in Theater*. 25 July 2019.

JP 3-50. (U) *Personnel Recovery*. 14 August 2023.

JP 3-85. *Joint Electromagnetic Spectrum Operations*. 22 May 2020.

ARMY PUBLICATIONS

Most Army publications are available online: https://armypubs.army.mil.

Battle drills are available online: https://rdl.train.army.mil.

ADP 1. *The Army*. 31 July 2019.

ADP 1-01. *Doctrine Primer*. 31 July 2019.

ADP 2-0. *Intelligence*. 31 July 2019.

ADP 3-0. *Operations*. 21 March 2025.

ADP 3-07. *Stability*. 31 July 2019.

ADP 3-37. *Protection*. 10 January 2024.

ADP 3-90. *Offense and Defense*. 31 July 2019.

ADP 5-0. *The Operations Process*. 31 July 2019.

ADP 6-0. *Mission Command: Command and Control of Army Forces*. 31 July 2019.

ADP 6-22. *Army Leadership and the Profession*. 31 July 2019.

ATP 2-01. (U) *Collection Management*. 17 August 2021.

ATP 2-01.3. *Intelligence Preparation of the Operational Environment*. 1 March 2019.

ATP 3-01.8. *Techniques for Combined Arms for Air Defense*. 29 July 2016.

ATP 3-01.15/MCTP 10-10B/NTTP 3-01.8/AFTTP 3-2.31. *Multi-Service Tactics, Techniques, and Procedures for Air and Missile Defense*. 7 April 2023.

ATP 3-01.50. *Air Defense and Airspace Management (ADAM) Cell Operation*. 5 April 2013.

ATP 3-01.60. *Counter-Rocket, Artillery, and Mortar Operations*. 10 May 2013.

ATP 3-01.81. *Counter-Unmanned Aircraft System (C-UAS) Operations.* 23 May 2025.
ATP 3-04.1. *Aviation Tactical Employment*. 7 May 2020.
ATP 3-06.11. *Brigade Combat Team Urban Operations*. 27 September 2024.
ATP 3-09.32/MCRP 3-31.6/NTTP 3-09.2/AFTTP 3-2.6. *Multi-Service Tactics, Techniques, and Procedures for Joint Application of Firepower*. 29 November 2023.
ATP 3-18.13. *Special Forces Use of Pack Animals*. 28 March 2024.
ATP 3-21.8. *Infantry Rifle Platoon and Squad*. 11 January 2024.
ATP 3-21.10. *Infantry Rifle Company*. 14 May 2018.
ATP 3-21.18. *Foot Marches*. 13 April 2022.
ATP 3-21.20. *Infantry Battalion*. 28 December 2017.
ATP 3-21.51. *Subterranean Operations*. 1 November 2019.
ATP 3-21.90/MCTP 3-01D. *Tactical Employment of Mortars*. 9 October 2019.
ATP 3-34.22. *Engineer Operations—Brigade Combat Team and Below*. 14 April 2021.
ATP 3-34.80. *Geospatial Engineering*. 26 March 2024.
ATP 3-34.81/MCWP 3-17.4. *Engineer Reconnaissance*. 1 March 2016.
ATP 3-37.10/MCRP 3-40D.13. *Base Camps*. 27 January 2017.
ATP 3-39.34. *Military Working Dogs*. 19 May 2022.
ATP 3-55.4. *Techniques for Information Collection During Operations Among Populations*. 5 April 2016.
ATP 3-90.8, C1/MCTP 3-34B. (U) *Combined Arms Countermobility*. 30 November 2021.
ATP 3-90.96/MCTP 12-10E. *Arctic and Extreme Cold Weather Operations*. 24 February 2025.
ATP 3-90.97. *Mountain Warfare and Cold Weather Operations*. 29 April 2016.
ATP 3-91. *Division Operations*. 17 October 2014.
ATP 3-94.4. *Reconstitution Operations*. 5 May 2021.
ATP 4-02.2. *Medical Evacuation*. 12 July 2019.
ATP 4-02.5. *Casualty Care*. 10 May 2013.
ATP 4-02.13. *Casualty Evacuation*. 30 June 2021.
ATP 4-25.12. *Unit Field Sanitation Teams*. 30 April 2014.
ATP 5-19. *Risk Management*. 9 November 2021.
ATP 6-0.5. *Command Post Organization and Operations*. 1 March 2017.
Battle Drill 07-PLT-D8015. *React to Unmanned Aircraft While Dismounted – Platoon*. 14 April 2025.
FM 2-0. *Intelligence*. 1 October 2023.
FM 3-0. *Operations*. 21 March 2025.
FM 3-04. *Army Aviation*. 27 March 2025.
FM 3-07. *Stability*. 2 June 2014.
FM 3-34. *Engineer Operations*. 18 December 2020.
FM 3-53. *Military Information Support Operations*. 4 January 2013.
FM 3-55. *Information Collection*. 3 May 2013.
FM 3-90. *Tactics*. 1 May 2023.
FM 3-96. *Brigade Combat Team*. 19 January 2021.
FM 3-99. *Airborne and Air Assault Operations*. 6 March 2015.
FM 4-02. *Army Health System*. 17 November 2020.
FM 6-0. *Commander and Staff Organization and Operations*. 16 May 2022.
FM 6-02. *Signal Support to Operations*. 13 September 2019.
FM 6-22. *Developing Leaders*. 1 November 2022.
FM 6-27/MCTP 11-10C. *The Commander's Handbook on the Law of Land Warfare*. 7 August 2019.

TB MED 505. *Altitude Acclimatization and Illness Management*. 30 September 2010.

TB MED 507. *Heat Stress Control and Heat Casualty Management*. 12 April 2022.

TC 3-97.61 (FM 3-97.61). *Military Mountaineering*. 26 July 2012.

TC 4-02.1. *First Aid*. 21 January 2016.

TC 4-02.3. *Field Hygiene and Sanitation*. 6 May 2015.

PRESCRIBED FORMS

This section contains no entries.

REFERENCED FORMS

Unless otherwise indicated, DA forms are available online: https://armypubs.army.mil/. DD forms are available online: https://www.esd.whs.mil/Directives/forms/.

DA Form 1156. *Casualty Feeder Card*.

DA Form 2028. *Recommended Changes to Publications and Blank Forms*.

DA Form 2404. *Equipment Inspection and Maintenance Worksheet*.

DA Form 5988-E. *Equipment Maintenance and Inspection Worksheet.*

DD Form 1380. *Tactical Combat Casualty Care (TCCC) Card*.

This page intentionally left blank.

Index

Entries are by paragraph number.

A

actions on contact. 3-39
area defense
  forward defense. 4-5
  mobility. 6-82
attacking deeper. 4-11

B

breakout. 4-9
  exfiltrate. 4-10

C

casualty evacuation. 6-150
checks
  precombat. 5-182
close air support. 2-5
close combat attack. 2-5, 6-60
commander's intent. 2-23
communication
  retransmission station. 2-56
communications. 2-48
  RETRANS. 2-51
  tactical satellite. 2-55
  ultra high frequency. 2-55
  VHF. 2-48
counterreconnaissance forces. 4-58

D

defense
  breakout. 4-9
  characteristics. 4-16
  denial operations. 4-7
  of a linear obstacle. 4-99
  perimeter. 4-103
  when encircled. 4-8
defense operations. 4-1
defensive operations
  plan and prepare. 4-27
  security. 4-23
  warfighting function considerations. 4-40
deliberate attack. 3-102
direct fire planning and control
  control. 6-33
  principles. 6-20
dismounted marches. 5-154
dismounted movement rates. 5-30

E

en route sustainment. 5-219
engineer support. 5-217
equipment
  maintenance. 5-184
explosive ordnance disposal. 2-5

H

halts
  scheduled. 5-205
  unscheduled. 5-208
hasty and deliberate attacks. 3-100

I

individual load. 5-240
information collection
  tactical level. 6-1
inspection
  precombat. 5-183
intelligence operations
  definition. 6-14
intelligence preparation of the battlefield
  products. 2-69, 2-91

L

leadership. 2-1
  junior leadership. 2-3
load
  individual. 5-240

M

maintenance equipment. 5-184
march
  limited visibility. 5-188
  rehearsal. 5-180
  security. 5-201
medical evacuation. 6-150
military information support operations. 2-5
military working dogs. 6-227
mission planning
  avenues of approach. 2-78
  cover and concealment. 2-83
  key terrain. 2-79
  observation and fields of fire. 2-82
  terrain. 2-72
  weather. 2-85
mountain climate. 1-39
  effects on operations. 1-53
movement to contact
  search and attack. 3-82

O

offensive operations. 3-1
  audacity. 3-16
  blocking positions. 3-89
  concentration. 3-12
  direct and indirect fires. 3-94
  finding the enemy. 3-84
  finishing the enemy. 3-99
  fixing the enemy. 3-86
  movement to contact. 3-81
  plan and prepare. 3-22
  tempo. 3-14
other assets and attachments. 6-218
  military working dogs. 6-227
  special teams. 6-219
other tactical operations. 5-1

P

patrols. 5-81
precombat
  checks. 5-182
  inspections. 5-183
preventive maintenance checks and services. 5-185
protection. 6-87

Entries are by paragraph number.

R

raid
  illustration. 3-113
relief in place. 4-14
resupply considerations. 6-190
risk
  management. 5-247
  tolerance. 5-248
risk management
  five steps. 2-35

S

specialized equipment and skills. 5-53
stay-behind operations. 4-12
support
  engineer. 5-217
sustainment. 6-111
  acclimatization of personnel. 6-127
  altitude sickness. 6-135
  en route. 5-219
  hygiene. 6-167 individual equipment. 6-170 nutrition. 6-161 Soldier load. 6-113 temperature effects. 6-139

T

terrain class mobility. 5-26
tunnels and caves. 5-132

U

unmanned aircraft system. 2-5

W

warfighting function considerations
  defensive operations. 4-40
warfighting functions and considerations
  infiltration. 3-35
  offensive operations. 3-28

ATP 3-21.50

29 July 2025

By Order of the Secretary of the Army:

RANDY A. GEORGE
General, United States Army
Chief of Staff

Official:

MATTHEW L. SANNITO
Acting Administrative Assistant to the
Secretary of the Army
2519711

DISTRIBUTION:
Active Army, Army National Guard, and United States Army Reserve. Distributed in electronic media only(EMO).

This page intentionally left blank.

This page intentionally left blank.

This page intentionally left blank.

PIN: 206987-000